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THE OIL AND GAS JOURNAL

University Training

WITH a new school year starting, those who have the responsibility of management in the oil industry are endeavoring to determine the technically trained manpower that will be available this year and later. Educators, two years after the close of the war, now have an accurate gage of the student deficits created by the national emergency, and a better perspective of the future in education devoted to the industrial arts.

Contrary to the assumption of some, the G.I. student-aid provisions are not of themselves a solution to the problem of supplying the mounting demands for graduates of technical schools. It is true that government assistance will enable many students to complete scientific and engineering courses who otherwise would not be able to do so. But the increases do not offset the losses in young men and women who are not starting or completing university training following military service.

The petroleum industry is directly concerned with every phase of this situation. It could absorb double the number of qualified graduates that will be available from the petroleum-engineering schools over the next 5 years. Reflecting the interest of the industry, the Journal in its September 6 issue started a series of articles describing the universities granting P.E. degrees and those offering petroleum courses.

Petroleum's needs extend to practically every phase of scientific and professional training. Some companies are not able to expand their research and development facilities as rapidly as they would like because they cannot obtain personnel. Postgraduate training is a requisite in much of the laboratory work that has been projected for the future.

Management can assist the universities in providing the trained technical leadership that will be required over the next decade. An immediate problem is better pay for teachers, many of whom have left university faculties because of more remunerative positions offered by industry.

As regards students, investigators point out that starting immediately the industry will have to look for its new technical talent to those graduating from high schools who will not have government aid in their university work. One competent observer with a national outlook recommends that oil companies select their personnel from the high schools and assist students showing special technical abilities in their training at universities where greatly increased costs will otherwise be prohibitive to a sizable fraction of prospective students.

The petroleum industry has moved into a front-line position in research and the applied industrial arts, with several new frontiers in the offing. Success is largely dependent on an enlarged flow of trained university personnel from scientific and engineering schools in this and other countries.

Five Per Cent Gain in Demand Seen for First Quarter 1948

THE oil industry in the first quarter of 1948 is expected to meet a demand for its products which will be about 5 per cent greater than current 1947 requirements.

This estimate is made in the latest forecast of the U. S. Bureau of Mines. The bureau's forecast of demand for crude oil for September includes a revised forecast for 1947 and the first quarter of 1948.

In estimating demand the first quarter of 1948, consideration must be taken of "limiting factors affecting total product supply for the year," the bureau said. If exports are reduced substantially, the increase in domestic demand might amount to 6 per cent, instead of the 5 per cent otherwise.

The first quarter 1948 forecast assumes that runs to stills cannot be increased more than about 4 per cent and that no large increase in products imports will take place.

One increase to supply the first quarter 1948 will be a substantial gain in liquid products from natural-gasoline and cycling plants, the bureau said. If the industry meets substantially greater requirements for kerosine, heating oils, and motor fuels, it will be at the expense of a decline in residual-fuel oil consumption.

The bureau revised its forecast of total demand for all oils in 1947 to 2,118,000,000 bbl., compared with the 1947 forecast of 2,092,000,000 bbl. made last June. Actual demand for all oils in the second quarter 1947 was 513,400,000 bbl., or 5,642,000 bbl. daily.

September Motor-Fuel Demand

Discussing the current situation, the bureau said: "The primary factor in supply and demand is the amount of crude oil that can be run to stills. Actual runs to stills amounted to 5,120,000 bbl. daily in June and averaged 4,925,000 bbl. daily in the second quarter. Based on current data, runs are estimated at 5,173,000 for July and 5,200,000 for August and are forecast at 5,180,000 bbl. daily for September, making an average of 5,185,000 bbl. daily for the third quarter. The increase in runs to the current record levels has necessitated an upward revision in the estimates of product supply and demand for the balance of the year."

For motor fuel, the bureau placed demand in September at 73,000,000 bbl. Current data for July and August combined with the September forecast indicate that total demand for motor fuel the third quarter will approximate 228,000,000 bbl. In April, actual motor-fuel demand was 67,300,000 bbl., in May 74,600,000 bbl., and in June 75,600,000 bbl. The second-quarter total of 217,500,000 bbl. included exports of 11,900,000 bbl.

Crude-oil production at the record rate of 5,220,000 bbl. daily will be needed to meet demand in September. Actual April demand for domestic crude was 4,725,000 bbl. daily in April, 4,992,000 bbl. daily in May, and 5,100,000 bbl. daily in June, averaging 4,940,000 bbl. daily the second quarter. Crude-oil demand in July is estimated at 5,190,000 bbl. daily and 5,200,000 bbl. daily in August, the bureau noted.

In another report on the supply situation last week, the American Petroleum Institute said domestic demand the first half of 1947 was 10.12 per cent over the same period in 1946. Half-year consumption in the United States was 964,209,000 bbl. for 1947 as compared to 875,584,000 bbl. the previous year. Exports in the same period increased 4.32 per cent.

Refinery operations have been maintained at more than 90 per cent of rated capacity the past 12 weeks, the Institute said. Domestic production of crude oil has been at the record rate of more than 5,000,000 bbl. daily for the past 17 weeks.

Court Fight Indicated on Texas' New Gas-Price Law

LEGALITY of Texas' new law providing a minimum price for sweet natural gas used by carbon-black manufacturers was questioned September 4 when the Texas Railroad Commission held a hearing on gas regulation in Amarillo.

E. H. Foster, Amarillo, attorney representing Phillips Petroleum Co., told the commission Phillips did not believe the bill constitutional. He said Phillips is contemplating to test the law in court. A Cities Service Gas Co. representative indicated his company also doubts the legality of the act.

The law authorizes the use of sweet gas from wells in Panhandle field for carbon-black without first passing through a gasoline plant, subject to two conditions: (1) That the carbon-black recovery is not less than 1½ lb. per 1,000 cu. ft., and (2) that the royalty rate and well-head price equals that paid in the immediate vicinity for gas used for light and fuel purposes.

The law authorizes annual or semi-annual hearings to determine the market price for gas used for light and fuel. The Amarillo hearings was the first by the commission since passage of the measure.

No action was taken by the commission at the hearing. The matter of well-head prices was taken under advisement. Any findings, under terms of the law, must be posted for compliance by carbon-black manufacturers using sweet gas.

Testimony at the hearing showed the wide range of prices being paid for gas. D. D. Harrington, of Hagy, Harrington, & Marsh, Amarillo, testified the weighted average price at the present time should be between 4⅛ and 4½ cents per 1,000 cu. ft. In 1946, he said, the average was 4.25225 cents on a total production of 258,795,329,000 cu. ft. Individual prices brought out at the hearing varied from 1¼ to 7 cents.

Witnesses for Phillips Petroleum revealed that since July 1 the company has been submitting new contracts calling for 4 cents per 1,000 cu. ft., replacing existing contracts of 2 to 2¼ cents. These contracts call for a raise to 4½ in 1957, 4¾ at the end of 1967 and 5 cents in 1977, with 1-cent increase of each 10-year period thereafter.

At the hearing, R. C. Kay, Amarillo, chairman of the Panhandle Producers and Royalty Owners Association gas committee, proposed that gas production in Sherman and Hansford counties be segregated from the Panhandle field. Witnesses asked that this be made a part of Hutoton field of Kansas and Oklahoma and be prorated on the same basis. The commission said a hearing will be called on the proposal.

A.I.M.E. Section to Meet

The first technical meeting of the Oklahoma City section of the American Institute of Mining and Metallurgical Engineers will be held in Oklahoma City September 18. Gordon Fisher, Gulf Oil Corp., Fort Worth, will speak on "Practical Aspects of Reservoir Engineering."

Military Seeks to Simplify Buying; Prompt Action Unlikely

WASHINGTON.—Top levels of the armed forces are moving to meet the demand of the petroleum industry that the military shall bring about more order in the calls upon the industry for its products.

When leading oil men conferred here August 15 with officials of the War, Navy, and Interior departments on the question of meeting the service's shortage of gas and oil, industry spokesmen pressed upon the government officials the need for centralized procurement.

Two studies of how to simplify, coordinate, and approach centralization of government buying, are now under way. War Secretary Kenneth C. Royall has personally passed the word within his department, it is understood, that something along this line be undertaken promptly.

A more important study, however, is that under way in the Army-Navy Munitions Board. The board is conducting an intensive inquiry into the simplification of petroleum buying.

Despite all the steam behind this development, however, there is no likelihood of "very prompt" action, one foremost official explained. The services want to simplify the procurement of oil. They recognize the complaints of the industry that it never can find out how much is expected of it with the Army, the Navy, and the Air Forces all out buying.

Centralization Not Compatible

On the other hand, "complete centralization" is not compatible with the military, this high official explained. "Procurement cannot be divorced from military responsibility . . . and petroleum supplies are vital to the Army, Navy and Air Forces."

This official, however, was emphatic that the Army-Navy Munitions Board will work out some solution, some alteration, in the methods of procurement which will be more satisfactory to the industry. What he was getting at, he said, is that desirable as centralized procurement might be from the industry's standpoint, the peculiar problems of each of the services must be taken into account.

Pending the A-N Munitions Board study of petroleum procurement methods, John Kenney, assistant secretary of the Navy, and Royall, have issued a joint directive not only to the A-N Munition Board but also to the Army-Navy Petroleum Board and the Joint A-N Petroleum Purchase Agency, looking toward greater coordination of the buying of the different services and greater ease in procurement. While this directive was issued prior to the August 15 meeting, its text was not made public at the time and its terms apparently are not known to many elements of the industry. The text of the order follows:

"1. In view of the difficulties which have arisen in the purchase of petroleum products for the services, it is hereby directed that the following procedure for the purchase of all petroleum products by the services be followed:

"(a) Any solicitation of industry for the purchase of particular petroleum products shall be done either jointly or with the concurrence of other interested services.

"(b) Any offer received pursuant to a solicitation made in accordance with paragraph (a) above or for a particular product in common use will be deemed to have been made to all services. Where any particular product is in common use, the service section level of the Joint Army-Navy Petroleum Purchase Agency will endeavor to agree upon an allocation of such offer. The basis of the allocation shall be on the immediate requirements of the services concerned. In the event that allocation cannot be made in this manner the matter will be referred to Army-Navy Petroleum Board whose decision will be final and binding on all services.

"2. The procedure outlined above is an interim procedure pending the assignment of purchase responsibility for petroleum products by the Army and Navy Munitions Board."

The last paragraph of the directive refers to the study which is under way by the A-N Munitions Board to simplify procurement.

Industry's Advice Requested

In connection with this study, informed officials expressed the opinion that in accepting a temporary assignment as a special assistant to the secretary of war to study matters of industrial mobilization and procurement, Ed W. Pauley will avoid any phase of the oil question. Because of the fracas in Congress last year over Pauley's nomination to be undersecretary of the Navy, Pauley will not again give any opportunity to critics to say that as an oil man he is using his influence to direct any matters pertaining to the relationship of the Government with the oil industry.

Meanwhile, Secretary of the Interior Krug, dealing with more immediate procurement matters, has asked the industry to advise the Government on how much oil it expects to supply the Government between now and next June 30.

This is an informational request. The proposal of the Oil and Gas Division of the Interior Department that it should suggest to each supplier of petroleum products the minimum amounts on which the company should bid for government sale, is still far from dead, an informed official said. This suggestion was referred to the Justice Department for clearance to make sure that if OGD did this, the companies complying would not run afoul of the antitrust laws.

In his request, Krug called on refiners to give the military services the advantage of their advance planning, even though they do not feel free to make commitments for two and three quarters ahead.

"The idea is that the military shall get some pretty good idea of how much gas and oil the industry is planning to supply them throughout the period ending June 30, 1948, even though the industry is not yet prepared to submit firm bids for this amount," one official explained.

Krug called upon the industry for these estimates in a statement released September 2. In asking estimates of the supplies the refiners think they can furnish the Government, officials are recognizing, it was explained, that under present circumstances they cannot get long-term firm commitments. Nevertheless, officials believe that industry men themselves are making their own plans as to what they will sell to the Government under conditions that they can foresee. Even without firm commitments, the military will be aided if it can get an idea what the industry is planning.

Sinclair Wyoming Buying Lost Soldier Properties

Sinclair Wyoming Oil Co. is now in the final stages of the purchase of properties of Sharples Oil Corp. in Lost Soldier field, Fremont County, Wyoming, according to information from Denver.

Sinclair Wyoming also is seeking to buy the Lost Soldier interest of Denkmann Lumber Co. These transactions would give Sinclair control of all producing properties in the field, which with a production of more than 35,000,000 bbl. since 1916, is considered one of the most prolific in the Rocky Mountain region.

Sharples interests include a one-half interest with Sinclair in 80 acres on the north side of the field and one-half with Denkmann on another 80 acres on the south side. Production from Sharples leases has been approximately 500 bbl. daily. The field now has 27 Tensleep sand producing wells with a productive area of about 1,100 acres.

Second Oklahoma Field Ordered Unitized

THE Medrano sand zone of West Cement, Oklahoma, field was ordered unitized September 5 by the Oklahoma Corporation Commission in the second action taken under terms of the state's 1945 unit operation law.

The unitization involves some 37,000 acres with 37 oil wells and 19 gas wells. Reford Bond, commission chairman, said unitization would protect correlation rights of landowners and royalty owners and would more equitably distribute the recoverable oil and gas.

Plans for an appeal to the state Supreme Court were announced by attorneys for opponents of unitization. The commission's order followed by only a few weeks a similar order providing unit operation of the Hunton lime zone of West Edmond field. Oklahoma's unitization statute is the only one of its kind, and the West Edmond order attracted wide attention, both because of the size of the field involved and because it was the first action under the law.

In the West Cement field case, Phillips Petroleum Co. had filed application with the commission for unit operation. Phillips represented operators controlling 94 per cent of the interests. Chief opposition to unitization has come from the Caddo-Grady Counties Royalty Owners Association.

Under the program planned with unit operation, most gas wells on the north side of the structure will be shut in and the oil produced from the south side. Gas injection is planned later. A substantial increase in recovery is expected, over the 24,000,000 bbl.—or about 25 per cent of the oil originally in place—considered recoverable under competitive production methods.

NPC to Meet October 9; Four New Members Named

Next quarterly meeting of the National Petroleum Council has been called for 9:30 a.m., October 9 in the Conference Room of the secretary of Interior in Washington by Walter S. Hallanan, council chairman.

The council's agenda includes reports of various committees, some of which are on the petroleum supply situation, including problems confronting the industry in meeting military and government requirements.

Four new members of the council have been announced by J. A. Krug, secretary of the Department of the Interior. They are: Bruce K. Brown, Chicago, president of Pan American Petroleum Corp., and vice president of Standard Oil Co. (Ind.); Ardon B. Judd, Houston, president of the Petroleum Equipment Suppliers Association and vice president and general manager of Republic Supply Co.; Alexander Fraser, New York, president of Shell Union Oil Co.; and Russel S. Williams, Indianapolis, president of the Individually Branded Petroleum Association of America and president of Casteria, Inc.

June Report Shows Gain In New Industry Employes

The petroleum refining industry showed an increase in the number of persons hired during the month of June. Bureau of Labor Statistics indicate that 30 persons per 1,000 employed were hired in June as compared to 26 in May. The total separation figures, made up almost wholly of persons quitting their jobs, remained the same for June as in May —10 per 1,000 employed.

In the industry classification, petroleum and coal products, 32 persons were hired per 1,000 employed during June, an increase over the 27 per 1,000 in May. Total job separations for the same period decreased to 10 per 1,000 against a total of 11 for the previous month.

Manufacturing industries as a whole showed a seasonal increase in the rate of hiring from 48 to 53 per 1,000 employes from May to June, and yet it was the lowest rate for any June since 1940. Layoffs decreased from the 1947 high point of 14 per 1,000 in May to 11 per 1,000 in June, but were still somewhat above the level of the early months of this year.

Rocky Mountain Geology Guide Book Available

A new guide book particularly directed to the interest of the major and independent oil operators of the Rocky Mountain region is now available in limited supply.

The guide book was originally made up for those attending the field conference sponsored by the Geological Society of America, American Association of Petroleum Geologists, and the Wyoming Geological Association, at Casper, Wyo., last month. The guide book is made of 20 special papers, maps, stratigraphic section, well logs, and other illustrations of the basin geology, according to R. W. McCanne, Ohio Oil Co., Casper, and president of Wyoming Geological Association.

Oklahoma Rules Listed

General rules and regulations concerning drilling and production of oil and gas wells in Oklahoma, as prepared by conservation officials and operators, are set forth in a booklet now ready for distribution. The state commission adopted these rules and regulations in October 1946.

Crude, Gasoline Output At New Record Level

FOR the second successive week, United States crude-oil output and refinery gasoline have reached new record highs. The week ended September 6 shows an daily average crude output of 5,189,000 bbl., an increase of 16,610 bbl. daily over the previous weekly high of 5,172,490 bbl. daily, according to The Oil and Gas Journal.

Gasoline production the week ended August 30 reached 16,753,000 bbl. daily, an increase over the previous record-week by 214,000 bbl. daily. The week of August 23 showed a total of 16,539,000 bbl. daily.

Louisiana for the second consecutive week reached an all-time high in crude production, showing a daily average of 439,525 bbl. the week ended September 6 against a daily average of 437,400 bbl. the previous week. Colorado set an all-time high for the week ended August 30 but was down 2,870 bbl. daily for the week of September 6.

Production of kerosine for the week ended September 6 showed a decline of 181,000 bbl. daily while gas oil and distillate fuel oil increased from 5,892,000 bbl. to 5,919,000 bbl. daily. Residual fuel oil showed an increase of 288,000 bbl. over the previous week.

O.W.I.U. Loses in Ruling On Taft-Hartley Law

A federal District Court in Fort Worth ruled September 8 that the Oil Workers International Union must comply with provisions of the Taft-Hartley law requiring labor unions to file affidavits that their officers are not Communists.

The judge upheld the constitutionality of this part of the Taft-Hartley law. His decision was given in what was regarded as likely to become a test case of the right of the National Labor Relations Board in freezing some 3,500 cases until officers of the unions involved sign non-Communist affidavits.

July Refining Dividends Increase 11 Per Cent

Cash dividends for the oil-refining industry for the 3-month period ended July 31 increased 29 per cent over the same period last year. Cash dividends for July amounted to $25,400,000 as compared to $22,900,000 for July in 1946, an increase of 11 per cent.

A total of $444,900,000 cash dividends was reported by United States corporations for July 1947 while $394,500,000 was distributed last year.

_____this week

TRANS-ARABIAN—Trans-Arabian Pipe Line designates Sidon, Lebanon, as Mediterranean terminus, ending speculation and uncertainty on the question. . . . Final survey of the route now under way. . . . ¶Russell B. Brown, I.P.A.A. counsel, declares in letter to secretary of commerce that export of pipe for proposed line would be detrimental to domestic industry. . . . Says approval of Trans-Arabian's application for export of some 40,000 tons in fourth quarter not justified. . . . Trans-Arabian officials, however, in statement on plans assert line would be "a major step toward easing present oil shortage around the world, including the United States. . . ."

TIDELANDS—Attorney General Clark rules that Interior Department does not have right under existing federal law to grant leases in offshore areas. . . . Ruling places question before Congress. . . . Governor Davis of Louisiana and Governor Jester of Texas meet in New Orleans to make plans to enlist support of all other states in campaign for congressional action giving states clear title to submerged areas. . . .

SUPPLY—Bureau of Mines revises demand forecast for fourth time this year, predicts demand the first quarter 1948 will be from 5 to 6 per cent above current record levels. . . . Bureau forecast says primary factor in supply and demand is amount of crude which can be run to stills. . . . ¶A.P.I. statement calls attention to fact that industry has produced crude at rate of more than 5,000,000 bbl. daily for the last 17 weeks and has maintained refinery operations at more than 90 per cent capacity the last 12 weeks. . . . ¶Max Ball, director of the Oil and Gas Division, in letter to Representative Hope of Kansas says petroleum supply situation will continue "uncomfortably tight" through coming winter. . . .

REFINING—Petrol Terminal Corp., Philadelphia, buys Texas City aviation-gasoline plant from Government for $3,250,000. . . . Plant is first sold under stipulation purchaser will give priority to filling requirements for military. . . . ¶Department of Commerce announces new policy confining mandatory use of synthetic rubber mainly to tires and tubes. . . . Action expected to result in drop in synthetic use from about 42 per cent to about 33 per cent of nation's total rubber consumption. . . .

EXPLORATION—New shallow oil pool found 1 1/2 miles southwest of Hoffman field, Duval County, Texas. . . . ¶Prospects look good for two new Arbuckle pools in Kansas. . . . ¶Union Sulphur resumes pumping tests on Jones County, Mississippi, wildcat. . . . ¶Drill-stem tests on Bee and Jackson County, Texas, wildcats look promising. . . . ¶Imperial completes eighth successive producer in Canada's Leduc field. . . . ¶New oil sand discovered in Venice pool, Plaquemines Parish, Louisiana, by Tide Water Associated. . . . ¶Rocky Mountain attention focused on Elk Basin area wells. . . . ¶Sunray adds producing zone in its new field in Orcutt area, Santa Barbara County, California. . . .

When a wild 10-point buck deer ran across this pipe-line right-of-way, a bell-hole welder shooed him toward the camera of Paul Reed, pipeline editor of The Oil and Gas Journal, who accompanied J. E. McGeath, assistant general superintendent, and George T. Jackson, construction superintendent, Magnolia Pipe Line Co., when they visited the spread of Eastern Construction Co., laying 20-in. pipe through the dense forests of southwestern Arkansas for Section 2 of Magnolia's 647-mile crude-oil line now being constructed from Corsicana, Tex., to Patoka, Ill.

International

WORLD-WIDE OIL DEVELOPMENTS

Sidon, Lebanon, Designated as Trans-Arabian Terminus

WITH the selection of Sidon, about 30 miles south of Beirut, Lebanon, as the Mediterranean terminus of Trans-Arabian Pipe Line Co., and with the rolling of 30 and 31-in. pipe scheduled to get under way at Consolidated Steel Co.'s plants next month, actual laying of the line is expected to start early in 1948.

Assuming that there are no delays in rolling and shipping pipe, the 300,000-bbl. daily 1,030-mile pipe line probably will be completed late in 1949. Eventually the capacity may be stepped up to around 500,000 bbl. daily. Meanwhile, Arabian American Oil Co. is shooting at a production of 650,000 bbl. daily sometime in 1949, a daily potential that will take care of the pipe-line throughput and at the same time provide sufficient crude for Aramco's Ras Tanura refinery and to supplement charging stock for Bahrein Petroleum Co., Ltd.'s refinery on Bahrein Island. An excess production probably will be sold f.o.b. Ras Tanura. Currently Argentina's Yacimientos Petroliferos Fiscales (Government Oil Fields) is lifting Saudi Arabian crude.

There has been some speculation about the possibility of Armaco providing crude for Standard-Vacuum Oil Co.'s Palembang refinery in the Netherlands East Indies. But this presumably would be only until the N.E.I. political situation cleared and Standard-Vacuum rehabilitated its oil fields there.

Early this year a study was made of the economic aspect of the projected 32-36-in. line of Middle East Pipe Lines, Ltd., a company jointly owned by Standard Oil Co. (N.J.), Socony-Vacuum Oil Co., Inc., and Anglo-Iranian Oil Co., Ltd., using a joint right-of-way with Trans-Arabian. However, this has since been discarded due to geographical differences. The second line will carry crude oil from Kuwait and Iran to some Mediterranean port. Due to lack of sufficient rolling capacity, pipe for this second line will not be rolled until after Trans-Arabian's order has been filled. Initial combined capacity of the two Middle East pipe lines will be 600,000 bbl. daily.

Jersey's Interest

Jersey Standard will have a 30 per cent interest in Trans-Arabian, along with a similar percentage ownership with Standard Oil Co. of California and The Texas Co. Socony-Vacuum will own 10 per cent. In the second line to be built (Iran-Kuwait to the Mediterranean) Jersey Standard will own 40 per cent, Socony-Vacuum 10 and Anglo-Iranian 50 per cent.

Final route of Trans-Arabian Pipe Line Co.'s Persian Gulf-Mediterranean line. Signing of an agreement early this month with Syria for transit rights has led to the designation of Sidon, Lebanon, as Mediterranean terminus

In view of the statement that completion of the Trans-Arabian line "will be a major step toward easing the present oil shortage around the world, including the United States," speculation arises as to whether (or how soon) Middle East crude will be shipped to East Coast refineries. Trans-Arabian's Vice President J. H. MacGaregill said that "it will make available 300,000 bbl. of oil daily to Europe, thereby relieving unprecedented demands on United States petroleum sources."

Definite selection of Sidon as the Mediterranean terminal was made possible by signing of a convention for transit rights with the Government of Syria September 1, MacGaregill explained *(The Oil and Gas Journal, September 6, page 45)*. Construction of camps at both ends of the line is already under way. While Sidon contains a natural harbor, it is without shipping facilities at present and construction of an oil terminal will be literally "from the ground up." Aramco's William J. Lanahan, Middle East representative, played an instrumental part in concluding treaties with the various governments.

Abqaiq field, largest in Saudi Arabia, has 19 producing wells at present with five rigs drilling. Current Saudi Arabian production is at the rate of 263,000 bbl. daily, a figure which probably will be increased to 300,000 bbl. by the end of this year. Most of this production is processed at the company's Ras Tanura refinery which is running at upwards of 110,000 bbl. daily and the Bahrein refinery which has a daily throughput of 135,000 bbl. daily. Output of both these plants is slated to be enlarged soon.

The tanker haul around the Arabian Peninsula and through the Suez Canal (where substantial tolls are collected) to the Mediterranean is approximately 3,650 miles. Trans-Arabian's pipe line will cut 2,620 miles from the water route.

B. E. Hull, president of Trans-Arabian, is now in the Middle East directing preliminary construction work. The final survey is being made.

Countries Nationalizing Oil Getting Cool Reception on U. S. Loans

International
WORLD-WIDE OIL DEVELOPMENTS

ALL indications point to a definite tightening up in the policy of the United States' Export-Import Bank regarding oil-industry loans to foreign nationals or governments where countries concerned have either nationalized the petroleum industry or in some other method prohibited the free play of normal competitive forces.

This information from well-informed sources is highlighted by the observation that the Export-Import Bank may go out of existence in the near future.

There appears to be an undeclared trend in the bank's attitude to favor competitive United States enterprises which are not unduly discriminated against in foreign lands. In Latin America, the one exception of what may become a rule appears to be Bolivia which recently obtained a few additional millions of dollars to complete the construction of the projected Tin Tin-Cochabamba pipe line and refineries at Cochabamba and at Sucre. However, this loan is explained by the fact that Yacimientos Petroliferos Fiscales Bolivianos (Bolivian Government Oil Fields) had, in all good faith, and on the basis of previous loans, entered into certain commitments with United States pipeline and refinery-design concerns. And in both cases the programs had progressed to advanced stages. The recent additional loan is merely to implement an already well-established project.

Possibly the latest setback suffered by a Latin American country in negotiations with the Export-Import Bank was when a delegation from Chile returned empty handed. Whether Communist forces, which still constitute a potent factor in Chilean activities, were responsible for the bank's refusal or not is a subject for speculation. But a portion of any loan made to the Chilean Government might find its way into promotion of that country's oil production, private participation in which is constitutionally illegal. Corporacion de Fomento de la Produccion, a government agency, handles all production operations. It is known that this agency itself has not directly sought Export-Import Bank funds either to implement its production, to construct the projected $10,000,000 refinery, or to build pipe lines.

Bank Denies Loan

A few weeks ago Brazilian representatives of Refinaria de Petroleos do Districto Federal, S.A., were turned down by the Export-Import Bank for funds to erect a 10,000-bbl. daily $10,000,000 refinery at Rio de Janeiro. Indications in some quarters are that this refinery may be constructed regardless—but not with Export-Import Bank funds—it being held that private Brazilian capital will be raised.

Concerning Argentina it is practically a certainty that any agency of Argentina's Government would have no luck obtaining U.S. Export-Import Bank funds unless the government policy of continued nationalization either slackens or certain trends are reversed. With President Peron's economic program bogging down there is speculation in some sources that a greater degree of freedom may be returned to foreign capital interested in helping develop that country's economy.

Reports from Latin America indicate that Yacimientos Petroliferos Fiscales (Argentine Government Oil Fields) has been encountering some difficulty in renewing its contract with Arabian American Oil Co. for crude oil from that company's Saudi Arabian fields. Last year Y.P.F. signed a contract calling for delivery f.o.b. Ras Tanura, of 2,800,000 bbl. It is known that U.S. State Department officials are far from pleased with Argentina's policy of nationalism. Private foreign oil companies there are feeling the government's restrictions to an ever-increasing degree.

T.L.L. July Production

July production of Trinidad Leaseholds, Ltd., from its own fields, showed a slight decrease compared to June. Production for July was 542,854 bbl. or a daily average of 17,511 bbl. as compared to a total of 546,283 bbl. for June or a daily average of 18,209 bbl.

These are scenes of the spudding-in ceremonies for Sinclair Panama Oil Corp.'s wildcat on Colon Island off Bocas del Toro, Panama. Sinclair Panama is jointly owned by Venezuelan Petroleum Co., a Sinclair Oil Corp. affiliate, and Cities Service Oil Co. It was given an 18,000,000-acre concession by Panama earlier this year. Left, the site of the well, 1 Bocas del Toro; right, the operation receives the priest's blessing

Iran's Benefits From Oil—A. I. O. C.'s Record of Achievement

by Warren W. Burns

International

FROM a barren wind-blown desert to a modern flourishing community—

That's the record achieved by Anglo-Iranian Oil Co., Ltd., since it started oil operations in southwestern Iran 45 years ago. And it is a record which Anglo-Iranian officials measure in terms of human achievement, social and cultural advances, and an all-around improved standard of living for the country and nationals of this Middle East nation.

As evidence of its human engineering in a date-fringed desert, the company recently published a 24-page summary with graphic illustrations of what Anglo-Iranian means to Iranians. The following excerpt is an illustration:

"Today the contrast is startling. Abadan Island (at the head of the Persian Gulf) contains the largest oil refinery in the world, with a capacity of some 20,000,000 tons (approximately 422,000 bbl. daily) of oil yearly. Round it has sprung up a thriving town which with its neighboring villages and communities comprises about 120,000 inhabitants. One hundred and twenty miles to the northeast amid the foothills of the great Zabros Mountains a number of large and very productive oil fields are being developed by a busy industrial community."

The Pusht-i-Borg area in the oil fields of Anglo-Iranian's concession in Southwest Iran

In these fields and at Abadan the company has provided housing, electric lighting, and water services for some 16,500 employes, including more than 12,000 manual workers. Roads, sewage disposal, and other modern facilities were also built at company expense. An additional extensive building program—interrupted by the war—is again under way. All permanent company dwellings are of brick or stone and equipped with modern aids. Some 2,000 new houses have been built since 1945, and work has commenced on another 500.

To a country where medical needs were once available only to a small percentage of its inhabitants, Anglo-Iranian from the beginning provided its own medical and health services. Today the company's medical organization includes 70 doctors, a dental staff, and numerous matrons, nurses, medical assistants, and health inspectors. Health clinics are being set up in residential areas in addition to existing dispensaries. As eye diseases, particularly trachoma, are very prevalent, the Abadan hospital contains a special opthalmic section. Special clinics for the treatment of trachoma have been established.

The facilities organized by Anglo-Iranian for education and training includes: assistance rendered to the

General air view of the world's largest refinery, the 422,000-bbl. daily capacity plant of Anglo-Iranian at Abadan

The Technical Institute at Abadan built by Anglo-Iranian at a cost of more than $400,000

Iranian Government's Department of Education, especially in the Province of Khuzistan, in which the company's main activities are located; company-operated adult and apprentice-training programs for artisans, process workers, foremen and clerks; higher training (technical and commercial) at the Abadan Technical Institute; and education and training of selected Iranians in the United Kingdom.

Many Schools Presented

The company built and equipped 17 schools for general education and presented them to local authorities. In 1939 Anglo-Iranian presented to Tehran University complete and modern laboratory equipment. Recently it has provided annual vacation courses for technical students of Tehran University and borne all traveling and out-of-pocket expenses for the duration of these courses. Company officials concerned with education maintain close contact with local education officials.

Upwards of 1,900 employes attend night classes. All company apprentices and trainees receive payment during training periods. Youths entering these courses come from all over Iran, and for those whose homes are not in Abadan the company provides well-equipped lodgings. The Technical Institute at Abadan was built by Anglo-Iranian at a cost upwards of $400,000. Petroleum technology is one of the principal courses.

Concerning food, clothing, and other essential commodities, the company in 1945 spent more than $4,000,000 distributing free and subsidized food and clothing. When inflationary tendencies relaxed, the company ceased to supply commodities free, or below cost, and advanced wages to compensate fully for the change, meanwhile continuing to safeguard the workers by providing their main necessities in company shops at controlled prices.

Anglo-Iranian's multiplicity of services to its employes and to Iran at large are already legend, and its policy is best summed up by the company itself in the following brief paragraph:

"The social welfare of all who serve the company is a matter of prime concern to the management, and a policy of continual advancement is pursued."

Anglo-Iranian Statement Sees Further Expansion

LARGE-SCALE expansion in the production, refining, transportation, and marketing operations of Anglo-Iranian Oil Co., Ltd., are seen in the years immediately ahead, according to the recent statement by Sir William Fraser, A.I.O.C.'s board chairman.

Pointing up the company's expansion plans is the fact that its aviation-fuel services to the world's international air lines will be greatly augmented. And back of these plans are definite programs for increased crude-oil production from Iran, as well as from Kuwait and Iraq, and greater refinery runs. Throughput at the Abadan refinery reached a new high in 1946 of 17,673,000 tons, or approximately 372,828 bbl. daily.

"The (Abadan) refinery is being further extended," Fraser said, "by the provision of a plant for the production of lubricants for local sale, by the addition of a catalytic cracking plant and by a major increase of storage capacity."

Anglo-Iranian's tanker fleet has been increased to 96 ships, of approximately 1,100,000 dwt., compared with 82 prewar tankers of 899,000 dwt. Four tankers have been purchased from the U. S. Maritime Commission and it is hoped that restrictions will be relaxed whereby A.I.O.C. can buy more, Fraser said. The company has five diesel-driven tankers, each of about 16,000 dwt., on order.

The company's Middle East refineries, other than at Abadan, are all in full operation. These include the smaller plants at Kermanshah, Iran, and Alwand, Iraq. A.I.O.C. owns 50 per cent of Consolidated Refineries, Ltd., at Haifa where plans call for doubling that plant's capacity to approximately 190,000 bbl.

Commenting on the Agha Jari field, Fraser said that "further important structural information has been forthcoming from new wells brought into production during the year and has confirmed our previous estimate of the importance of the field." He then explained that the necessary additions to the pipe-line system to carry Agha Jari's production to Abadan and Bandur Mashur are being made.

At Lali, an area northwest of Masjid-i-Sulaiman, the company has brought in a well which showed a daily potential of 3,000 tons (about 25,100 bbl.). And while reserves in this area have not yet been determined, Fraser expressed the hope "that Lali will prove of major importance." The field is favorably located in relation to the existing pipe line.

International

Burma Refinery to Reach Prewar Level in 30 Months

Burmah Oil Co., Ltd., the largest oil company in Burma, does not expect to resume refinery operations on a scale commensurate with its prewar output, for another 30 months, according to a Reuters dispatch from Rangoon.

Most of Burmah Oil Co.'s crude oil, obtained through Assam Oil Co., Ltd., a subsidiary, at the prewar rate of 6,000 bbl. daily, is not being produced and presumably will not be until the reconstruction of the company's Syriam refinery near Rangoon. Before the war this refinery had a 20,000-bbl. daily capacity of which 3,000 bbl. was cracked. Burma had a daily crude-oil production of around 22,000 bbl.

Burmah's acting general manager reportedly stated that $6,000,000 has been spent on rehabilitation work, with 8,000 men already employed in the Yenangyaung oil fields and at the Syriam refinery site. *(For additional details on Burma's postwar oil activities see The Oil and Gas Journal, March 29, page 69).*

Peru Completes 27 Wells

A total of 27 producers were completed in Peru during the first quarter of 1947. Ten dry holes were drilled. According to the Office of International Trade, 43 rigs were drilling at the end of March.

Baku Decline Seen as Reason For Soviet-Iranian Deal

POSITIVE economic reasons appear to be motivating the Russians in their determination to obtain the proposed Iranian-Soviet oil concession in northern Iran. This becomes more evident with the disclosure, by a Soviet petroleum economist that Russia's once-prolific Baku oil fields, which lie not too far north of the Iranian concession, have experienced a sharp decline in production.

From a translation, by the U.S.S.R. division of the United States Department of Commerce's Office of International Trade, of an article in Planovoye Khozyaistvo, the official political-economic journal of Russia's State Planning Commission, it is evident that the drop in Russia's oil production is greater than could be accounted for by the volume of oil formerly supplied by Maikop and Grozny, the two other war-torn Caucasian areas.

Percentage figures in the Soviet press show that the war years resulted in a serious decline in Russia's total oil production. The figures on planned production for 1950 in relation to 1945 production make it possible to calculate Russian production in 1945 at 18,400,000 metric tons (approximately 383,000 bbl. daily) and 1946 production 12 per cent higher or 20,600,000 metric tons (approximately 429,000 bbl. daily).

Baku's 1945 output has been estimated at 11,400,000 metric tons (about 238,000 bbl. daly) compared with 21,000,000 metric tons (about 438,000 bbl. daily) in 1940. Commenting on the impact of the war, the Russian petroleum economist said:

Russian's Statement

"With the outbreak of the war the production of petroleum in Baku area dropped sharply. During 1941 and 1942 more than 1,000 wells ceased to operate, as the task of transporting oil out of the area became increasingly difficult.

"An even greater number of wells had to close down for lack of repairs. There was a shortage both of repair crews and of replacement parts, as the factories that formerly supplied such parts were converted to production of military supplies and arms.

"Inferior maintenance resulted in a drop in the output of wells continuing in operation, while the technical condition of the operating wells grew worse, as attempts were made to make repairs with used equipment transferred from inactive wells. Because of such dismantling, it became increasingly difficult to return inactivated wells to operation in subsequent months.

"Conditions in the Baku oil fields began to improve in 1943, when drilling and prospecting were resumed and workshops were repaired. Petroleum machinery began to be manufactured, so that by the end of 1944 Baku oil output had ceased to fall. However, postwar recovery of Baku oil industry has, in general, been slow.

"At the beginning of the fourth 5-Year Plan the oil industry of Azerbaidjan was less prepared for a rapid increase in output than were the eastern oil fields, despite the enormous reserves of the Apsheron Peninsula, the deposits under the Caspian, new oil fields in Neftechala, Kirovobad and elsewhere, and the confirmation, as a result of prospecting done in 1946, of the existence in the Baku district of large fields that have not been sufficiently studied.

"While the Soviet petroleum industry as a whole in 1946 increased output 12 per cent over 1945, the increase in the south, and particularly in Baku, was negligible."

Reasons for Slow Recovery

The Russian economist holds that the slow recovery is not so much attributable to the impact of the war as to defects long present in the operation of Baku. For instance, Baku wells have been over-produced, he states, explaining that "before the war oil obtained in this way formed about a quarter of the total yield. With this method only natural pressure is employed, and no attempt is made to maintain pressure by pumping gas or water into the stratum. Consequently the pressure falls rapidly, the period of flow is short and the decline in output is very sharp."

Moreover, he says, "secondary-recovery methods are not employed, and thus more than half the oil reserves remain in the ground and thousands of wells decline in yield much too early."

Russia's continued wasteful practices presumably were justified by the fact that no great investment of capital was necessary as long as the cheap natural pressure methods could be utilized.

The author cites, as one main defect in Russian oil operations, the fact that exploratory activities have always lagged behind new construction. "For example," he says, "there were so few prospected reserves at the beginning of the war that in 1941 they did not suffice to cover even a quarter of the yearly plan of new wells to be brought into operation. As a consequence, low-yield wells were exploited in ever-increasing numbers—resulting in a decline in the total yield of the fields. In the first years of the war, when prospecting operations ceased and there were no prospected high-yield wells, total output continued to decline."

Russia's program for exploratory drilling is not being carried out, the Soviet economist states. He explains that in 1945 only 63 per cent was fulfilled and in 1946 only 67 per cent. The volume of exploratory drilling in Baku in 1946 was less than in 1940. Moreover, Russia's plan for rehabilitating old wells is not being carried out according to schedule. When this is coupled with inadequate technological assistance and lack of certain vital drilling equipment, the immediate future is not bright.

International

Venezuela Accepts Two Royalty Oil Bids

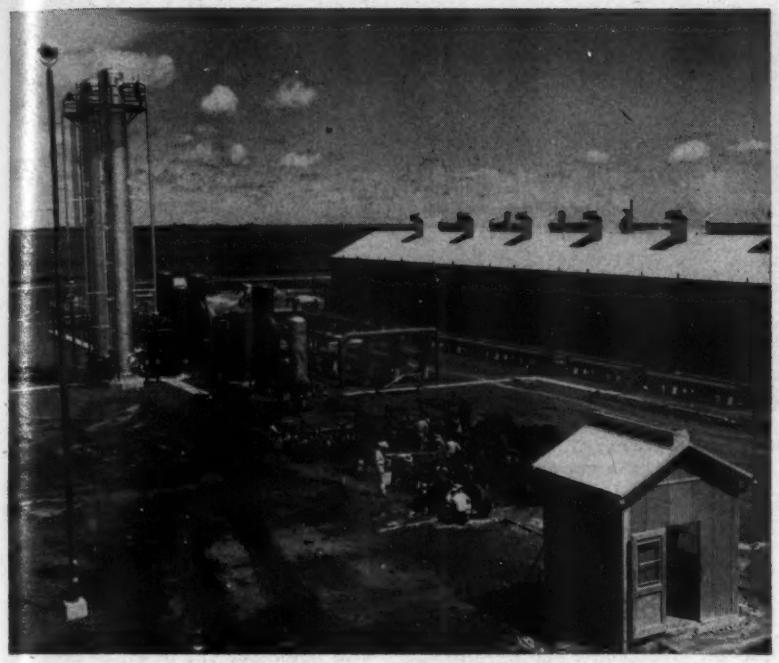
VENEZUELA'S Development Ministry has accepted two of the eight bids, opened last month, for part of the Government's royalty crude oil. A report from Caracas states that a Brazilian firm will purchase approximately 1,390,000 bbl. at prices providing a premium of from 20 to 50 cents a barrel. The other successful bidder is an Italian firm which will purchase an undisclosed amount at 20 cents a barrel premium.

Venezuela's minister of fomento explained late last month *(The Oil and Gas Journal, August 30, page 45)*, that additional bids may be sought on more of the country's royalty crude.

Correcting earlier reports, Dale W. Moore, of Dale W. Moore Oil Co., Houston, last week said his company bid for the entire amount of 35,760,000 bbl. of royalty crude oil offered by the Venezuelan Government.

The bids were opened in the office of the Minister of Fomento in Caracas. Offers for the oil were received by eight companies, including two from the United States, Dale W. Moore Oil Co. and Petroleum Terminal Corp., of Maryland.

Moore said his company bid for the entire 35,760,000 bbl. for delivery over 1948 and 1949. Previous reports said Moore bid only on 1,940,000 bbl. The Moore company operates as a crude-buying company in many fields and maintains deep-water storage at Corpus Christi, Tex., for assembling crude oil for tank loading as well as terminal arrangements at other Gulf ports.



Humble Oil & Refining Co.'s new Anahuac natural-gasoline plant currently processing about 33,000,000 cu. ft. of casing-head gas daily

Two New Plants Further Humble's Gas-Conservation Program

One of the most extensive gas-utilization programs in Texas is that being carried out by Humble Oil & Refining Co. This article describes two new plants recently placed in operation by the company. These are the Clear Lake and the Anahuac plants. When all projects planned or scheduled in the program are completed, total expenditure will approximate $10,000,000. A substantial reduction in the amount of casing-head gas now being flared at oil wells operated by the company will result.

THIS Clear Lake (Tex.) project was originated in early 1945 to provide a means of compressing and processing low-pressure casing-head gas from the nearby oil fields, thus conserving flared gas and also processing gas-well gas which previously had been passing directly into a gas-transmission system. This involved the gas produced with oil from the Webster (Friendswood), East Clear Lake, and Dickinson-Gillock oil fields, and gas-well gas from Halls Bayou and Dickinson gas wells. The Dickinson well pressure gasoline plant was dismantled and replaced by a new compressor station to compress and move the gas from Dickinson field at high pressure to the Clear Lake plant along with the gas-well gas from Dickinson

The total plant residue gas is delivered to a gas-transmission system serving Humble's Baytown refinery thus eliminating the flaring of the low-pressure casing-head gas from the three oil fields. Construction of the plant was started in January 1946, and the project was completed and operations began in March 1947.

Gas Sources and Quantities

The plant was designed to handle gas production from the following fields connected to the plant:

Webster field.—Gas is delivered from Webster field to the Clear Lake plant through an 18-in. line. Field separators operate at an approximate pressure of 75 psi. which will result in a pressure at the plant of 60 psi. An emergency pressure-relief regulator venting to the flare is installed at the plant to prevent excessive field-separator pressures in case the compressor unit is shut down.

East Clear Lake.—Field separators are operated at sufficient pressure to produce gas into the plant at a pressure of 60 psi.

Dickinson-Gillock.—Construction work was performed at the Dickinson plant to install three 600-hp. compressors and necessary equipment for compressing the oil-well gas produced to the plant from a suction pressure of 35 psi. and discharge through three compression ratios to a final pressure of 1,000 psi. The compressed gas is processed in the Clear Lake plant for recovery of desired gasoline hydrocarbons. The compressor capacity is approximately 9,000 M.c.f. per day of wet gas at the above conditions.

Halls Bayou and Dickinson gas wells.—The gas well at Halls Bayou and also gas wells in Dickinson field are operated in such a manner as to maintain a load for the Clear Lake plant and to meet necessary sales gas demands. The gas from these wells along with the compressed gas from Dickinson-Gillock is delivered to the Clear Lake absorber at a pressure of 800 psi.

Gas volumes to be processed in the new Clear Lake plant are:

OIL-WELL GAS

Field—	Volume (M.c.f./day)
Webster	20,000
East Clear Lake	5,000
Dickinson-Gillock*	6,000
Total	31,000

GAS-WELL GAS

Halls Bayou	4,000
Dickinson	15,000
Total oil-well and gas-well gas	50,000

*This gas to enter plant process with gas-well gas.

Design and Layout of Plant

Humble's design incorporates a basic two-stage-compression, oil-absorption-type installations with fractionating equipment for producing a deethanized gasoline product, and is engineered to recover 55 per cent of the propane, 99 per cent of the butanes, and 100 per cent of the pentanes and heavier. Particular attention has been given to effect minimum fuel consumption.

The low-pressure oil-well gas enters the plant through a meter run, then passes through an inlet gas separator and into the compressor suction header at 60 psi. Two stages of compression increase this pressure to 810 psi. At this pressure the gas, after cooling, passes into one of the two high-pressure absorbers. Residue gas from the absorber passes through a sales-gas meter run and into the gas-transmission line.

The second source of wet inlet gas, that from the gas wells and Dickinson, enters the plant at about 810 psi. It passes through a separator, a meter run, and then into the second high-

The Clear Lake natural gasoline plant where Humble Oil & Refining Co. extracts 835 bbl. of liquid products from about 51,000,000 cu. ft. of gas daily

pressure absorber, from which the residue gas stream passes through a sales-gas meter run and on into the transmission system.

Lean absorption oil is pumped over each of the main absorbers by a separate reciprocating pump. The combined rich-oil streams are passed into a flash tank, from which the flashed rich oil continues on through heat exchangers, preheaters, and into the stripper still. The flash tank vapors are contacted in a reabsorber, the residue of which is utilized as plant fuel.

The partially stripped rich oil from the stripper is passed on to the main gasoline still. The stripper overhead is contacted through a second reabsorber, with this residue gas also joining the plant fuel stream. Rich oil from this second reabsorber is passed through a separate set of heat exchangers, preheater, and it then joins the main hot oil stream to the still.

Still overhead vapors are passed through a primary and secondary set of condensers and receivers. Noncondensed gases from the secondary condenser are recompressed and the liquid is pumped into a raw make tank. The raw-make-tank liquid is pumped into the fractionator for the production of ethane-free bottoms and thence to storage.

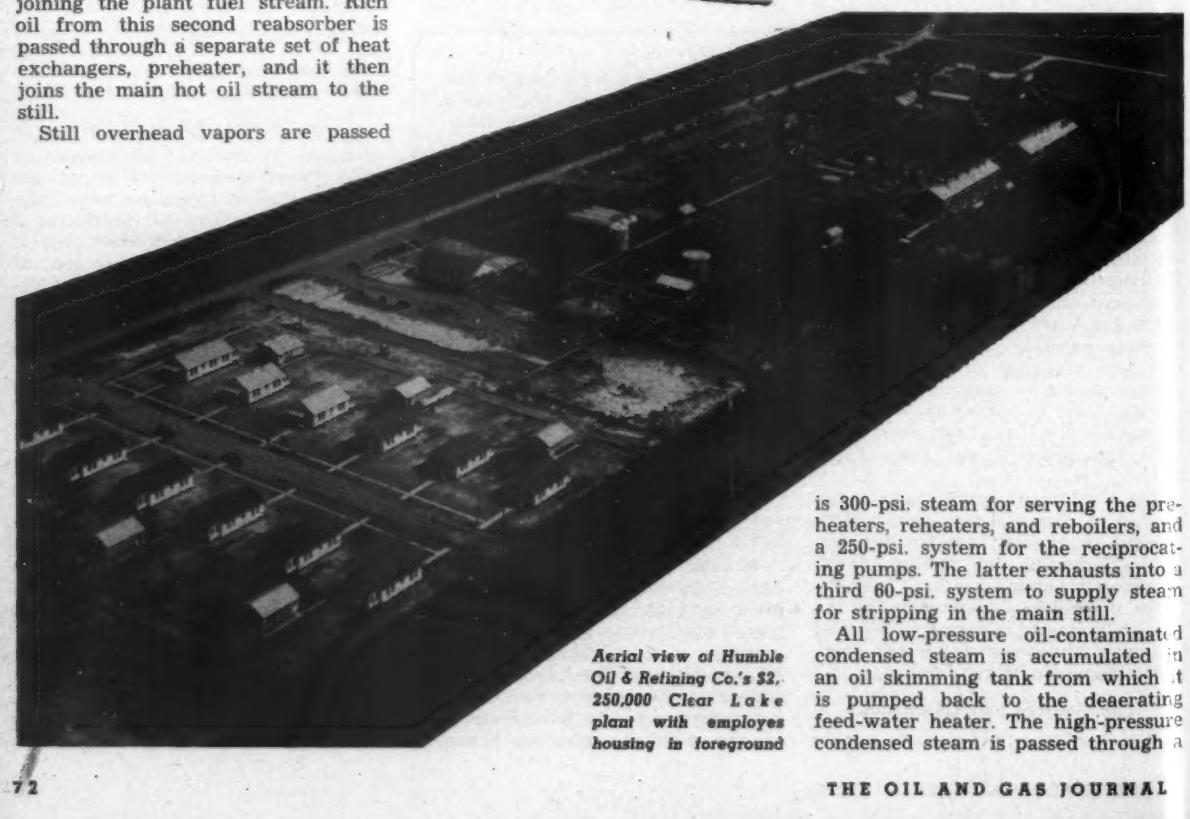
Compressor Equipment

Compressors in the plant consist of four 1,000-hp. two-cycle, gas-engine-driven units, each supplied with two low-stage and two high-stage cylinders. One end of the compressor building also houses the 200-hp. recompressor. Cooling water for the power and compressor cylinders is supplied from a closed system containing corrosion-inhibited condensed steam.

Temperature of the power-cylinder-cooling water is automatically controlled for each unit. All of the large gas engines in the plant are provided with automatic shutdown devices, in the event of low lubricating-oil pressure or water failure. A monorail and a bridge-type crane is supported from the building members so that any part of the compressors can be lifted and moved.

Steam plant.—This section of the plant consists of three 150-hp., 350-lb. W.P. welded-type oil-country boilers. They supply 25,000 lb./hr. of saturated steam at 300 psi. Three separate steam systems are utilized. There is 300-psi. steam for serving the preheaters, reheaters, and reboilers, and a 250-psi. system for the reciprocating pumps. The latter exhausts into a third 60-psi. system to supply steam for stripping in the main still.

All low-pressure oil-contaminated condensed steam is accumulated in an oil skimming tank from which it is pumped back to the deaerating feed-water heater. The high-pressure condensed steam is passed through a



Aerial view of Humble Oil & Refining Co.'s $2,250,000 Clear Lake plant with employes housing in foreground

partial condenser and then pressured into the deaerating heater. For this reason, the boilers require only 8 to 10 per cent raw-water make-up. A small chemical feed pump is provided to inject chemical solution into the boiler-feed-water stream as an internal boiler-water treatment.

Electricity.—The entire plant and camp electrical demand is supplied by a generator plant that consists of three 250-kw., 440-volt, 60-cycle gas-engine-driven generator sets. The switchboard is provided with automatic synchronizing devices for simplicity of operation, plus the conventional breakers, indicators, and meters. In addition to the low-oil-pressure and high-water-temperature shutdown for the generator drivers, an alarm system has been installed to sound a horn in the event the oil pressure starts to drop or the water temperature starts to increase, thereby warning the operators before the engine shuts down when trouble is imminent.

Water system.—An ample supply of deep well water of 3.5-gr. per gallon hardness is available from two wells drilled in the plant yard. One well is provided with a motor-driven pump, and a second well has a combination drive, either motor or gasoline engine. The cooling-tower makeup is first pumped through the reabsorber intercooler, then into the cooling-tower basin with a side stream passing to the boiler-water feed tank for makeup.

The cooling tower is an induced draft type with a capacity of 7,000 g.p.m., cooling from 100° to 85° F. This water is circulated by 100-hp., deep-well-type, motor-driven pumps. To maintain the system clean and low in total dissolved solids, a continuous vacuum-type chlorinator is installed, and a metered purge is constantly wasted so that the dissolved salts in the water will not concentrate over four times the original.

Safety features.—To shut down the plant in the event of an emergency, six automatic shutdown stations are located at distributed points in the plant yard. When the shutdown valve at any one of the stations is opened, gas pressure is transmitted to various piston-operated block valves and motor valves. These block the inlet high and low-pressure gas, block the outlet high-pressure gas from both main absorbers, open a vent valve to dump the high-pressure gas into the flare pit, block the fuel gas to the compressors, generator engines, and lean-oil pump engines, block the fuel gas to the boilers and open snuffing steam into the boiler fire boxes.

All compressor suction scrubbers are provided with low-level alarms and automatic liquid dump valves. Should a level of liquid continue to build up to a higher point, a float-operated switch grounds out the compressor magnetos. All absorber residue-gas scrubbers are provided with an automatic liquid dump and alarm in the event of oil accumulation.

Plant storage.—Three 12 by 50-ft. 10-psi. working pressure horizontal tanks provide capacity for 5 days' storage. The product is delivered to Humble's Baytown refinery by pipe line. As previously mentioned, this single product consists of a deethanized gasoline of about 95-lb. R.v.p. of the following composition: propane, 32 per cent, butanes 38 per cent, pentanes plus 30 per cent.

Anahuac Plant

Humble's Anahuac natural-gasoline plant, latest among the projects to be completed in the company's postwar gas-conservation program, went into operation early in August. Work on the plant began in September 1946. Construction costs totaled $2,500,000.

The Anahuac installation also comprises one of the company's largest natural gasoline plants. It has sufficient capacity to handle all of the oil-well gas produced in Anahuac field, of which Humble owns about 80 per cent. On the basis of the Anahuac field's allowable of 26,000 bbl. per day, the new gasoline plant will process an average of about 33,000,000 cu. ft. per day of wet gas, although the compressor plant and distillation system will have a capacity of 45,000,000 cu. ft. per day.

Plant Description

This plant is designed as a two-stage-compression, oil-absorption-type unit, with stabilization facilities to produce a propane and heavier hydrocarbon mixture. The high-pressure residue gas at 800 psi. is to pass to the Tomball natural-gas system, and the quantity available for this purpose at full plant design load is estimated to be 40,800 M.c.f./day. The low-pressure residue gas is to be utilized for plant and camp fuel, and to supply the variable demands of the field fuel system. The gasoline-recovery unit is designed to permit economic recovery of gasoline, butanes, and propane hydrocarbons from the inlet gas to the plant.

Product Disposal

At present, it is planned for the finished product to consist of a mixture of propane, butanes, and gasoline hydrocarbons. This mixture is to be pumped from the plant storage tanks to Baytown through a 3-in. products line. Plant storage facilities consist of 3—12′ x 50′ psi. working pressure horizontal vessels of 1,150 bbl. each which are sufficient for approximately 4 days' production.

A standard Humble employes' camp is located at a road junction northwest of the plant and consists of 12 houses.

Interior Department Held Lacking "Tideland" Leasing Authority

WASHINGTON.—Attorney General Tom Clark has dropped on the Congressional lap the hot issue of whether the federal or the state governments should handle the leasing of "tideland" oil.

In a ruling for the benefit of Interior Secretary Krug, Clark said that notwithstanding the fact that the Supreme Court in the California case ruled that the United States owned the land out to the 3-mile limit off the coast of California, the Interior Department was "not required" to apply the Mineral Leasing Act; i.e., this did not make it incumbent upon the department to control the leasing.

Next step is whether the Interior Department will ask Congress for express authority to take jurisdiction over the leasing of these drilling rights from the states. Sources close to the secretary of the interior expressed the belief that a request for such specific authority could be expected promptly next year.

Offhand, the chances would seem to be against Congressional approval of such a proposal. Two years ago Congress resolved in favor of the states, but the President vetoed the proposal. The present Congress is more against federal control than the Congress which favored state control in 1945.

In view of Clark's ruling and an earlier similar opinion by attorneys in the Interior and Justice departments, officials in the Interior Department have rejected several hundred requests for leases on the Government's newly acquired offshore property in California.

These applications for leases have been received by Interior Department agencies, including the Bureau of Land Management. Other applications for offshore leases in the Gulf Coast area also probably will be rejected, a Bureau of Land Management official said, although the Supreme Court's ruling on the California submerged areas does not necessarily apply to the gulf.

Standards List Available

A catalog listing some 874 standards of the American Standards Association has recently been released. The new listing may be obtained free from the American Standards Association office, 70 East Forty-fifth Street, New York 17, New York.

Rubber Control Dropped; Synthetic Use to Drop

USE of synthetic rubber will be concentrated in the transportation field, principally in tires and tubes, until Congress enacts legislation establishing a long-term national rubber policy. This is provided in a new government policy announcement September 5.

Government controls limiting use of natural rubber in the manufacture of some 30,000 nontransportation items will be eliminated this week, according to the Office of Materials Distribution, Department of Commerce.

Government officials said adequate quantities of natural rubber are now available for most other uses than in transportation, and that synthetics represent approximately 42 per cent of consumption at the present.

Of the total synthetic and natural rubber processed, it is expected that as a result of the action last week about one-third of the consumption will be synthetic.

Tire specifications are unchanged by the new order. However, the manufacturer may turn out at least two grades of tires, containing different amounts of natural rubber, so long as his use of natural rubber in total production of these tires does not exceed the stipulated percentage.

Sun Abandons Second Test in Nova Scotia

Sun Oil Co., Ltd., abandoned its second test well in Nova Scotia, August 29, at a depth of 11,504 ft. Sun abandoned its first test November 30, 1945, at 6,506 ft. when tools were lost.

The second test was 5 miles south of Amherst, in Cumberland County, where Sun has an 8,640-sq. mile concession obtained under exploratory grants from the Nova Scotia provincial government.

Additional exploratory work will be done by Sun in Nova Scotia before plans are made for further drilling. George Bentley, of Beaumont, Tex., was the superintendent in charge of operations.

Two Producing Leases Sold in East Texas

Two producing properties in East Texas field have been reported sold for a total of $455,000.

W. L. Pickens and Tom Cook of Dallas have bought the 25-acre W. R. Nicholson lease with five oil wells from Omega Oil Co. for a reported $25,000 in cash and $150,000 out of three-fourths of the oil production.

Mar-Tex Realization Corp., Dallas, purchased a half interest from L. L. Sugar, Shreveport, in the C. M. Dickson tract with seven pumping wells. Consideration was reported at $250,000.

I.P.A.A. Official Attacks Pipe Export Application

ARABIAN AMERICAN OIL CO.'s application for government permission to export some 40,000 tons of steel pipe in the fourth quarter to commence construction of the Persian Gulf - Mediterranean line has been attacked in a letter sent to W. Averell Harriman, secretary of the Department of Commerce, by Russell B. Brown, general counsel of the Independent Petroleum Association of America.

Brown in his letter cited various statements to the effect that the domestic oil industry needs steel, particularly tubular goods, to meet United States' increasing requirements for petroleum products. He called attention to provisions of the export-license law requiring that the secretary of commerce be satisfied that the exportation of a commodity will not be contrary to the policy mandate of Congress "to protect the domestic economy . . ."

Brown attacked the several reported grounds on which the Arabian American application is based. He criticized the contention that refusal of the license would not make more steel available domestically since it could be warehoused indefinitely, and said construction of the line is "a matter of convenience" since there are abundant tankers to move Persian Gulf oil. He said the claim that denial of the license might lead to unfavorable political repercussions is "vague and fraught with imponderables." The I.P.A.A. official directed copies of his letter to 12 other government officials and congressmen. *(For other details on the Trans-Arabian line, see page 66).*

Brown last week also reported exports of seamless and welded casing and oil line pipe in the first half of 1947 totaled 166,293 tons, lacking only 13,488 tons of equaling exports of these goods for the entire year 1946. Should the trend continue, he pointed out, these exports will surpass the previous highest year of 1945.

California Group to Meet

Ralph Brown, instrument engineer at the Los Angeles plant of Firestone Tire & Rubber Co., will discuss "Use of Instruments in the Manufacturing of Tires" September 18 at the September meeting of the Southern California Meter Association at the Rio Hondo Country Club.

160-Acre Well Spacing Requested by Magnolia

IN a hearing before the Oklahoma Corporation Commission, Magnolia Petroleum Co. last week sought 160-acre well spacing in its Chitwood field production in Grady County. The spacing application applies only to the gas-condensate production and not to oil wells in the area.

Magnolia explained to the commission that costly drilling and low rate of recoverable gas and condensate make dense drilling in this area prohibitive.

The company expects to spend approximately $3,500,000 in developing the 1,000-acre Cunningham sand zone in Chitwood pool. In addition, the company is considering unit operation of the field with a view of recycling the gas. Such a project would involve $3,000,000, W. H. Speaker, gas-production engineer for the company at Dallas, said.

Anderson-Prichard Buys Burnell Field Properties

Anderson-Prichard Oil Corp. announced September 9 in Oklahoma City that it had purchased the oil-producing properties of American Liberty Oil Co., M. H. Marr, and Adah Marr in Burnell field, Karnes County, Texas.

Anderson-Prichard said it will participate in the construction of a $6,000,000 cycling plant which will handle gas from both Burnell and North Pettus fields. The 550 acres involved in the purchase will be included in unitization of Burnell field.

Pennsylvania Engineers Schedule Fall Meeting

The fall meeting of the oil and gas section of the Engineers' Society of Western Pennsylvania, will be held September 19 in the Emery Hotel in Bradford.

The program for the technical session follows:

"Oil Reservoir Variations as Observed from Closely Spaced Core Wells," Maynard M. Stevens, Ryder-Scott Co.; "A Job for the Petroleum Technologist," D. T. Ring, president of the Pennsylvania Grade Crude Oil Association; "Plans of the Pennsylvania Geological Survey as Relating to the Oil and Gas Industry," S. H. Cathcart, director of the Pennsylvania Bureau of Topographic and Geologic Survey; and "Field Test of Corrosion Inhibiter for Low pH Water," J. N. Breston, Pennsylvania Grade Crude Oil Association, and Kenneth Barton, Quaker State Oil Refining Corp.

PERSONALS

Murphree Prominent As Research Leader

E. V. MURPHREE, recently elected president of Standard Oil Development Co., central research organization of Standard Oil Co. (N. J.), has contributed to many of the company's leading technical developments during his 17 years with the Standard organizations.

Included are development of the Fluid catalytic cracking process; a process for synthesizing toluene; and a catalytic process for making butadiene from petroleum for synthetic rubber.

Murphree has succeeded Robert P Russell, who has resigned to become technical consultant to International Basic Economy Corp., organized by Nelson Rockefeller to improve the agricultural economy and promote agricultural and nutritional research and education in other countries.

Murphree, 48, is a graduate of the University of Kentucky where he captained the football team in his senior year, later taught school in Paris, Ill., and later became a staff assistant at Massachusetts Institute of Technology.

After 6 years of chemical engineering work, Murphree joined Standard Oil Co. (N. J.) in 1930 as director of a new technical group engaged in developing chemical processes from petroleum raw materials. Two years later he became director of research and development at the Esso laboratories in Baton Rouge, La., and in 1934 was elected vice president and director of Hydro Engineering & Chemical Co., a New York affiliate. He became manager of research and development for the development company in 1936, was appointed vice president in 1938, and became executive vice president in 1946.

During the war he served with the Office of Scientific Research and Development as a member of the S-1 committee, headed by J. B. Conant, which was instrumental in establishing the Manhattan Project, which developed the atomic bomb.

Harry T. Topping, of the purchasing department of Standard Oil Co. of New Jersey, received a 40-year service button from President **M. J. Rathbone** in New York September 3. Topping has been in the purchasing department since 1907.

M. M. Travis, consulting geologist at Houston, Tex., has opened an office in Denver, Colo.

Leslie Moses, former attorney associated with Fohs Oil Co., has joined Mid-States Oil Corp. at its Shreveport, La., offices.

M. W. Sublett, manager of the crude-oil purchasing department, Oklahoma and Kansas division of Sohio Petroleum Co., is moving his office from Tulsa to Oklahoma City.

James Burdette, formerly in the geological department of Derby Oil Co., Wichita, has joined the staff of The California Co. at Denver.

W. A. Pierce, Jr., formerly with Apex Drilling Co., Fort Worth, has joined the geological staff of the Sunray Oil Corp. in Fort Worth.

Dr. J. J. De Lange, head of physical research at the Shell Oil Co., Inc., laboratory in Amsterdam, The Netherlands, recently visited the Beacon (N.Y.) laboratories of The Texas Co. to study and discuss equipment and techniques.

Everett L. Smith, staff member of the Midland, Tex., office of the Texas Railroad Commission, Oil and Gas Division, has been promoted to junior engineer.

Col. J. C. Raaen, for 29 years actively associated with research and development work affecting the ordnance branch of the armed forces, has been appointed general manager of Universal Oil Products Co.'s laboratories at Riverside, Ill. **C. G. Gerhold,** former manager of the Universal's Riverside laboratories, is being transferred to the administrative department as assistant to **Edwin F. Nelson,** vice president. Gerhold's duties will be to coordinate research and technical activities.

T. S. Edrington has been appointed to the staff of Shell Oil Co., Inc., in the exploration department for the Midland (Tex.) area. He will be area geophysicist. Other recent appointments include **M. S. Metz,** acting assistant manager, and **M. H. McKiney,** assistant area geophysicist. **G. S. Corey** has been named head of the geological office for the western division of Shell; **H. E. Rankin,** chief geologist, central district; **G. W. Heid,** chief geologist, eastern district.

Edward M. Krech has joined J. M. Huber Corp. as director of purchases. He will coordinate all purchases for the ink, industrial products, clay, and oil and gas divisions with headquarters in Brooklyn, N. Y.

James E. Dyer, director and vice president of the Sinclair Oil Co., has been named head of an expanded

J. E. DYER

E. L. HUGHES

department to supervise transportation and distribution problems of the company. He will also head the newly established statistical department. Dyer was active in the building and operation of the Big Inch and Little Big Inch pipe lines. **Ernest L. Hughes** has been elected director and vice president in charge of sales of Sinclair Refining Co.

Robert W. McIlvain, Jr., manager of Pure Oil Co.'s Rocky Mountain producing division at Billings, Mont., will go to Chicago as assistant to the vice president in charge of production. This move brings about two other changes in the company: **Worth M. Saxon,** manager of the Michigan Producing division with headquarters at Saginaw, will replace McIlvain as head of the Rocky Mountain division; **Harvey J. Lowe,** manager of the company's Eastern Producing division offices in Newark, Ohio, will assume management of the Michigan division.

R. V. Safford, who the last 4 years has been in charge of Stanolind Oil & Gas Co.'s synthol (liquid fuels from natural gas) pilot plant in Tulsa, has been appointed to the staff of the research and development division of Pittsburgh Consolidated Coal Co.,

PERSONALS

which is preparing for large-scale work in the synthesis of liquid and gaseous fuels from coal. **Thomas G. Reynolds** was appointed chemical engineer on coal gasification in Pittsburgh Consolidation's development department. During the war he worked on the atomic-bomb project, and previously was process and project engineer for Foster Wheeler Corp. and with Continental Oil Co. for 4 years. Two other appointments were made to the service department.

Jack I. Laudermilk, petroleum engineer active in the Mid-Continent and Rocky Mountain areas, has returned to industrial work after several years collegiate teaching. He is assistant to the chief petroleum engineer of Socony-Vacuum Oil Co., Inc., New York. Laudermilk was a member of the faculty of the University of Texas prior to the war, then later head of the department of petroleum engineering, New Mexico School of Mines.

George McLernon, former petroleum engineer with Sunray Oil Corp., has joined J. E. Crosbie, Inc., Tulsa.

Herbert D. Armstrong, assistant treasurer of Standard Oil Co. of California, has been appointed as assistant to **H. D. Collier,** chairman of the board.

Robert Gordon has been appointed to the geological department of Cities Service Oil Co. at El Dorado, Kans., as junior engineer. **Robert E. Butler,** another new addition to Cities Service, has joined the Houston office as geophysical interpreter. **Edward L. Stauffacher,** Chicago, superintendent of operations for the company, has been named secretary of the newly formed Waterways Terminals, Inc.

Carl E. Cloud, general superintendent of the operating department for Oklahoma Natural Gas Co., has been named chairman of the newly created transmission committee of the Southern Gas Association. The following have been designated members of this committee: **Earl Fox,** Consolidated Gas Utilities Corp.; **Russell W. Hofsess,** Cities Service Gas Co.; **Allen B. Hiatt,** Phillips Petroleum Co.; **R. P. Gonzales,** Arkansas-Louisiana Gas Co.; **L. N. Brown,** West Texas Gas Co.; **J. W. Yeldell,** Alabama Gas Co.; **Eli R. Cunningham,** Texas Eastern Transmission Corp.; **Jack Bland,** Fort Smith Gas Corp.; and **Van Thompson,** Southern Union Gas Co.

Dan C. Nickles, for the last 3 years chief mechanical engineer in the research department of Seismograph Service Corp. in Tulsa, is scheduled to leave about October 1 for Buenos Aires, Argentina, where he will be petroleum and mining engineer for Pedro Serramalera, petroleum and mining-equipment importer.

Richard B. Holt, who graduated from the Colorado School of Mines in 1937 as a geological engineer, has been awarded The California Co.'s graduate fellowship at that school for 1947-48. His study will include research on the porosity of limestones.

N. A. Kendall, Houston, geologist and petroleum engineer with Standard Oil Co. of Texas, has left for Paris, France, to become a consultant to the Institut du Petrole, a bureau of the French Government.

R. A. Bishop, senior subsurface geologist for Socony-Vacuum Oil Co., Inc., in New York, has been transferred to Socony-Vacuum Exploration Co. in Calgary, Alta., as assistant to **C. S. Corbett,** manager of the Canadian operation. **D. M. West,** also a senior subsurface geologist for Socony-Vacuum, will handle Venezuelan and Colombian production details in New York.

J. F. Courtney, production foreman with Shell Oil Co., Inc., has been promoted to district foreman at Quitman, Tex. Other Shell promotions in the Texas-Gulf Coast area include: **M. W. Gray,** gang pusher to production foreman, Good Hope, Tex.; **L. E. Lacy,** head roustabout to production foreman, Quitman, Tex.; **H. E. Rankin,** senior geologist, Tulsa area to district geologist at Midland, Tex.; and **J. R. Van Arsdale,** senior draftsman to chief draftsman, Houston.

R. M. Carroll, junior exploitation engineer, has been transferred from Shell's East Texas division to Kilgore district. Other transfers include: **W. A. Allred,** junior seismologist, Jackson to Baillie Party 17; **J. H. Cranfield,** drilling foreman, Odessa, Tex., to Hobbs, N. M.; **D. M. Graham,** senior draftsman, New Orleans area to regional, Houston; **C. B. Gray,** superintendent, Wasson gas plant to TXL gas plant; **O. B. Jackson,** seismologist, Jackson Party 22, to Midland; **W. E. Jasper,** seismologist assistant, Midland to Jackson Party 22; **J. E. Lewis, Jr.,** junior mechanical engineer, Midland to Houston; **G. G. McNary,** seismologist, Party 74, to Midland **N. J. Mathews,** junior exploitation engineer, Iowa, La., to Midland; **R. E. Mitchell,** junior chemical engineer, gas-gasoline, Tulsa to Magnolia gas plant; **W. A. Scott,** junior exploitation engineer, Lake Charles, La., to Donaldsonville, La.; **H. L. Shatto,** junior mechanical engineer, Donaldsonville to Lake Charles; and **W. F. Wilgus,** senior exploitation engineer, Midland to Houston.

C. D. Winkleman has succeeded **L. F. Young,** retired, as the new superintendent in Oklahoma for Shell Pipe Line Corp.

Ralph S. Jackson, associated with Independent Exploration Co. of Houston since 1932 and vice president of that company since 1942, has resigned effective September 15 and is opening an office at Beeville, Tex., as a consulting geophysicist.

Willis Cullen Noble, Jr., has joined the geological department of the Tennessee Gas Transmission Co. of Houston as scout. Noble was previously connected with Gulf Oil Corp. and Deep Rock Oil Corp.

E. P. Neal, former Wichita district geologist for Tide Water Associated Oil Co., has been moved to the Tulsa area as district geologist succeeding **J. M. Clark** who recently resigned. Neal was formerly with the Shell Oil Co., Inc., in the production engineering department.

Herschel C. Smith has been elected vice president in charge of sales and director of American Oil Co. and its two subsidiary companies, Lord Baltimore Filling Stations, Inc., and Mexican Petroleum Corp. He succeeds **Charles H. Wagner** who recently was made president of American Oil Co.

Harry E. Allen, senior petroleum engineer with Carter Oil Co., has been transferred from Great Bend, Kans., to Purcell, Okla. Other transfers within the company include: **Absolam N. Breland,** district foreman, Vicksburg, Miss., to Magnolia, Ark.; **Kinyon E. Brooks,** trainee, to Falls City, Neb., as junior geophysicist; **Robert Morris Disch,** engineer, gravity-meter party, Jonesville, La., to Rolling Fork, Miss.; **Carroll B. McCampbell,** assistant seismograph operator, Falls City, Neb., to Egypt; **Hugh W. McCormick,** senior petroleum engineer, Magnolia, Ark., to Vicksburg, Miss., as district foreman; **Louis G. Pope,** geological trainee to Mattoon, Ill., as a junior geologist; **Charles L. Samz,** junior geophysicist, Falls City, Neb., to Rock Springs, Wyo.; **Jack D. Shults,** seismograph engineer, Rolling Fork, Miss., to Jonesville, La., as a gravity-meter engineer; **Lawrence P. Stamps,** foreman, Carmi, Ill., to St. Elmo, Ill.; **William S. Stovall,** senior petroleum engineer, Shreveport, La., to Magnolia, Ark.; **William H. Wurth,** assistant computer, Tulsa to Egypt as a seismograph computer.

M. E. Fannon, vice president of Sinclair Refining Co., has retired to his farm near Noel, Mo., after a 30-year career in the oil industry.

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Edwin W. Pauley, president of Petrol Corp. of Los Angeles, has been appointed special assistant to the secretary of war, assigned to industrial mobilization and procurement during the transition period of establishing the Department of the Army.

H. B. Howard, engineer for Phillips Petroleum Co., has been transferred from department headquarters in Midland, Tex., to the district production office at Odessa, Tex.

Charles R. Bickel has been named division manager of Shell Oil Co., Inc.'s recently established Odessa (Tex.) division. Transfers from Shell's Midland area offices to Odessa include: **A. C. Dahl,** to be production superintendent; **T. H. Dwyer,** division mechanical engineer; and **M. T. H. Johnson,** division subsurface engineer. Bickel, formerly manager of Shell's Oklahoma division at Oklahoma City, has been with Shell since 1927. Dahl, before his transfer to Odessa, was assistant area engineer in Midland. Dwyer joined the company in 1937 as junior mechanical engineer and has worked throughout the Texas area. Johnson, who also joined the company in 1937, came to Midland in 1946 as subsurface engineer. **F. R. Lovering** was transferred from Odessa to the Midland area office on special assignment. Other personnel changes included: **G. R. Brainard,** transferred from Odessa to Hobbs, N. M., as assistant district superintendent; **L. E. Slagle** from Odessa to Hobbs as distract mechanical engineer.

S. F. Heard, vice president and managing director of Royalite Oil Co., Calgary, Alta., has been elected president succeeding the late Alexander Hannah. **A. C. Newton** has been elected vice president and **E. J. Chambers** director, to fill the vacancy on the board. Heard served with International Petroleum in Peru and in 1922 joined Standard Oil Co. of Argentina, returning in 1925 to take an executive post with Imperial Oil, Ltd.'s, production department at Toronto. He joined Royalite at Calgary in 1934, becoming director in 1936 and vice president in 1937.

Richard Madison, formerly economist for The Texas Co., has been appointed assistant to the management of Texaco's foreign operations. **Greer Orton** is the company's general manager in charge of foreign operations.

C. W. Hamilton, vice president in charge of foreign operations for Gulf Oil Corp., has returned from a combined business and pleasure trip to Denmark, Norway, and Sweden. Hamilton also is a director of Kuwait Oil Co., Ltd.

Charles W. Teater, Saginaw, Mich., is the choice of P. J. Hoffmaster, state conservation director, to become a new member of the Michigan oil advisory board. Teater, an independent operator, has been in the production end of the industry since coming to Saginaw in 1929. Confirmation of the appointment will be asked by Hoffmaster at the September 15 meeting of the Conservation Commission. If confirmed, Teater will serve until May 1949 as successor to the late James C. Graves of Saginaw.

Shifts

E. R. Woolfolk, geologist, Stanolind Oil & Gas Co., Aztec to Farmington, N. M.; **Roy M. Huffington,** geologist, Humble Oil & Refining Co., Santa Rosa to Carlsbad, N. M.; **Jerry Covington,** geologist, Humble Oil & Refining Co., Roswell to Tularosa, N M.; **E. Drexel Johnson,** geologist, Santa Rosa, Inc., Hackensack, Minn., to Harlingen, Tex.; **J. R. Capshaw,** superintendent, Morrison Drilling Co., Cut Bank, Mont., to Meetretse, Wyo.; **Rex M. Grivetti,** geologist, The Texas Co., Vernonia, Ore., to Taft, Calif.

Ben A. Burdette, engineer, Socony-Vacuum Oil Co., Inc., Casper, Wyo., to Augusta, Kans.; **G. S. Wolbert, Jr.,** engineer, Phillips Petroleum Co., Fairfax to Norman, Okla.; **Robert L. Shick,** engineer, Sohio Petroleum Co., Oklahoma City to Norman, Okla.; **W. R. Goodier,** engineer, Shell Oil Co., Inc., Tulsa to Oklahoma City; **Robert H. Norton,** engineer, Shell Oil Co., Inc., Tulsa to Wichita, Kans.; **E. W. Steffenhagen,** engineer, Shell Oil Co., Inc., Tulsa to Jeaneretta, La.

William S. Herdan, engineer, Southern California Gas Co., Burbank to Los Angeles; **J. L. Brown,** engineer, Shell Oil Co., Inc., Los Angeles to Houston; **James J. Dolan,** engineer, Standard Oil Co. of California, Whittier, Calif., to Wellsville, N. Y.; **B. F. Thomas,** foreman, Atlantic Refining Co., Aransas Pass, Tex., to Refugio, Tex.; **Robert H. Barnes,** foreman, General Geophysical Co., Crockett to Spur, Tex.

Vernon P. Cantwell, engineer, Pan American Production Co., Harlingen to Lyford, Tex.; **M. A. Mills,** superintendent, Humble Oil & Refining Co., Luling to Refugio, Tex.; **Eugene P. Crowell,** foreman, Sun Oil Co., Plainview to Beaumont, Tex.; **R. L. Gallaway,** foreman, The Texas Co., Donaldsonville to Morgan City, La.; **L. M. Wilson,** engineer, Gulf Oil Corp., Welch to Lafayette, La.; **Murry Williford,** foreman, Phillips Petroleum Co., Hutchinson, Kans., to Del Rio, Tex.

DEATHS

W. R. Ramsey, 61, Oklahoma City independent oil operator and head of Ramsey Oils, Inc., died September 7 in Los Angeles. He was founder of Ramsey Petroleum Corp. in 1928 which was sold last year to Stanolind Oil & Gas Co. After the sale he founded the Ramsey Oils, Inc. Ramsey, a one-time Oklahoma ranch hand and bank employe, began his career in wildcat leases in Louisiana, later making strikes at Powell and Mexia, Texas, and in the Cement area of Oklahoma.

Darius D. Moberly, 71, former still man at the Mid-Continent Petroleum Corp. refinery in Tulsa before his retirement in 1944, died September 4 in Alameda, Calif. Moberly was with Mid-Continent Petroleum 26 years.

Edward H. Short, Sr., 70, retired oil executive, died September 5 in Tulsa. He was a former vice president of Margay Oil Co. and later an independent operator. He was associated with Warren Petroleum Corp. until his retirement in 1944. A son, Edward H. Short, Jr., is the editorial representative of The Oil and Gas Journal in Houston.

Joshua Bailey, 76, oil operator and associated with the late Joseph B. Mayer, was killed in an automobile accident September 3 at Jewel City, Ky.

John H. Baxter, 62, garage foreman of the Mid-Continent Petroleum Corp., died September 2 in Seminole, Okla.

Otto J. Beyer, 60, assistant storekeeper for Magnolia Petroleum Co., died September 3 in Fort Worth.

Frank C. Myers, 63, oil executive and attorney and president of Oklahoma Oil Co., died in Denver.

George Willis McMurry, 63, retired San Antonio oil man and former head of McMurry Drilling Co., died September 1 in Corpus Christi, Tex.

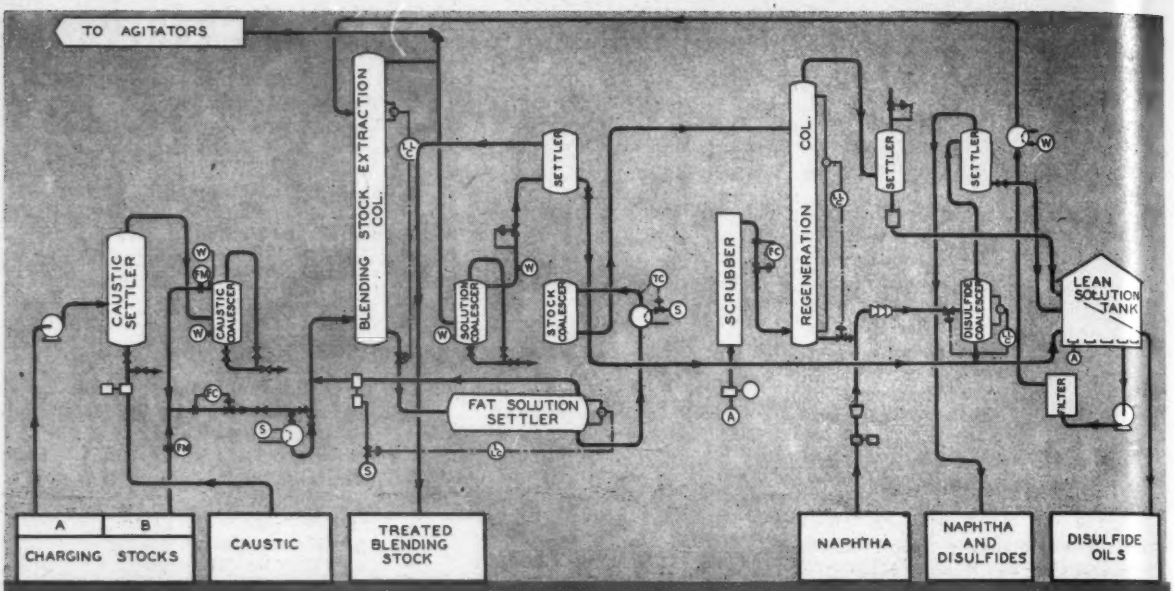
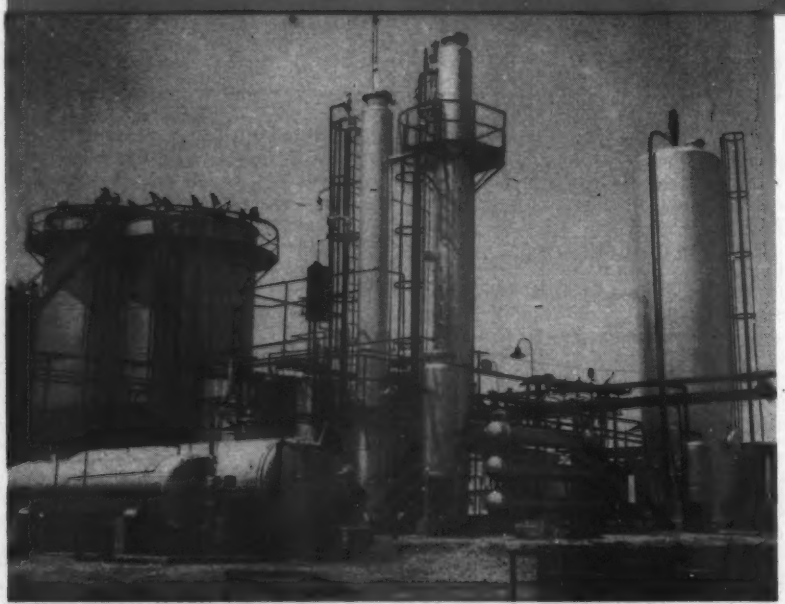


Fig. 1—Flow diagram of the C_5-C_6 charge from the thermal cracker through the tannin solutizer unit, operating in the Cities Service refinery at Ponca City, Okla.

Cities Service Tannin Solutizer Unit— Its Design, Operation, Results

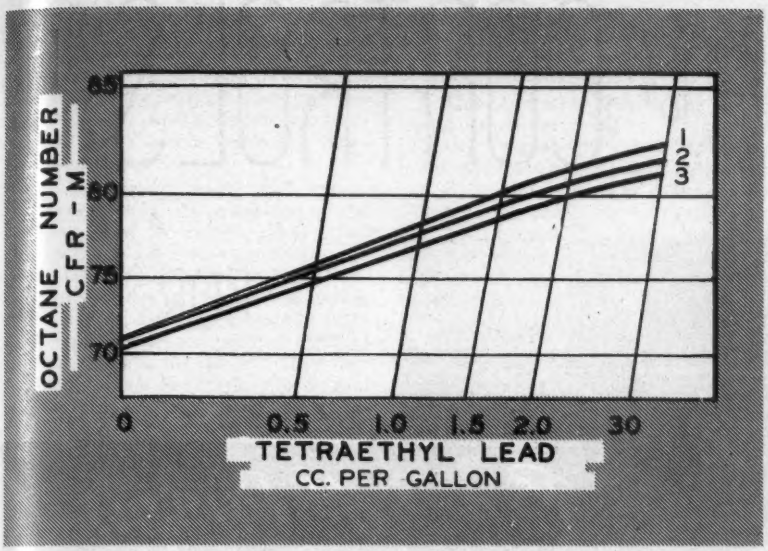
by R. B. Tuttle



The vessel in the center foreground of this view of the tannin solutizer unit operated by Cities Service Oil Co. at its Ponca City, Okla., refinery, is used for lean-solution storage. To the left of the storage tank is the settler and to the left and in the background are the other vessels in the process. Control equipment is housed in the small building to the right of the storage tank

OBSERVATIONS on the tannin-solutizer unit operations at the Ponca City, Okla., refinery of Cities Service Oil Co. show the process is performing very satisfactorily. Since July 1946, the unit has been operating on a debutanized material from the refinery's thermal cracking operations. The material, a C_5-C_6 mixture having a 300° F. end point, is processing at a 60-70 g.p.m. rate. After processing, the material is used as a motor-fuel component in an approximate ration of 1 part in 6 of the finished gasoline product.

Prior to the installation of the solutizer unit, about a year ago, the 300° F. end point blending material was treated in a noncontinuous process which is still used with good results at the refinery for treating heavy materials such as those in the 3-psi. R.v.p. range. Economically, this method for treating the heavier materials is shown to be successful as determined by several factors, among which is very low loss in processing. As compared with the previous method of treating the C_5-C_6 blending mixture, the solutizer process is shown to run to slightly higher over-all unit costs but such



Octane improvement: Curve 1 is for complete solutizer unit yield; Curve 2 is after caustic wash only; Curve 3 is before either treatment

costs are overbalanced by the savings resulting from improvement in lead response of the finished blended gasoline and reduced gasoline losses in the treating process.

To maintain desired performance the unit is operated approximately 58 per cent of the time, on a daily basis. This method of operation allows the solutizer to be on stream some 12-14 hours per day at charging rates near its design capacity for 7 days per week. Generally, operations for a normal day are handled by a two-shift crew.

Process Flow

Mixtures of the two debutanized materials from the thermal cracker is made, as indicated in Fig. 1, after one of the materials has passed through a caustic settler and coalescer. Each stream is metered in order to control mixture properties within specification limits. Temperature of the mixture before it enters the extraction column in the unit is regulated by heating a portion of it with steam in a tubular exchanger. A bypass at the feed-stock exchanger permits manual control of the feed stream's temperature whereas temperature of the fat solution stream is controlled automatically.

Chemical solution is fed into the extraction column at a point near two-thirds of its effective length above the rich-solution outlet. Flow of rich solution from the column to the settler is controlled with a liquid-level instrument located approximately at the same height as the chemical-solution inlet. Blending stock carried over to the fat-solution settler is delivered into the feed stream to the extraction column by a reciprocating pump which is controlled by an interface level controller on the settler. Treated stock is taken off near the top of the column, and after passing through a solution coalescer and a settling tank, the stock is delivered to storage. Such solution as may be trapped out in the settler flows by gravity to the lean-solution storage tank. Two of the coalescers, one in caustic and the other in solution service, are provided with manifolds for water backwash.

Principal items in the chemical section of the unit are a regenerator, two settling tanks, a mixer, and a disulfide oil coalescer. The regenerator receives the sulfur-enriched solution from the fat-solution settler after it has been heated and passed through the blending-stock coalescer. The sulfur-containing solution stream enters the regeneration column near its top and passed counter flow to an air stream which is fed into the column at its lower end. Exhaust air from the column passes through a settler on which a back pressure is maintained and thence vented to atmosphere. A liquid-level controller near the top of the column regulates outflow of regenerated solution. Flow of air from a compressor to the colmun is regulated with a control instrument after the stream has passed through a scrubber. Dispersion of air in the column is carried out efficiently with two 24-in. carbon diffuser tubes.

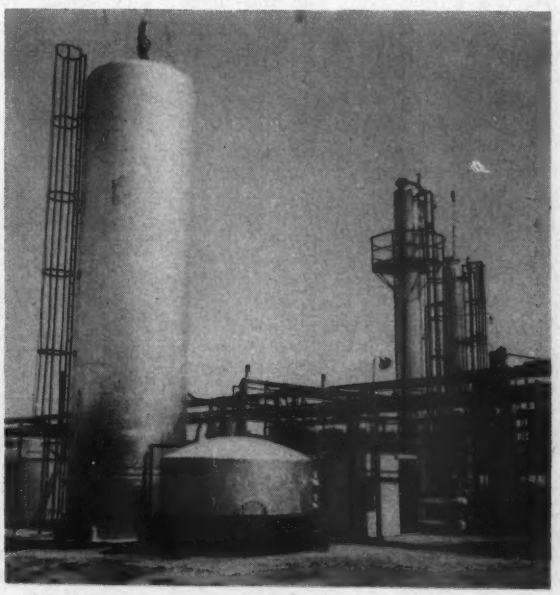
Naphtha wash is delivered into the system by pump and enters a mixer with the regenerated chemical solution stream from the bottom of the column before passing into the disulfide oil coalescer. The solution-naphtha stream flow into the coalescer is regulated by the level of liquid in the coalescer. The amount of naphtha delivered into the system per unit time is regulated manually; measurements of naphtha flow are made with an indicating instrument. The solution separated from the stream in the coalescer flows by gravity to the lean-solution tank and the stream's remains enter a settling tank where such traces of solution as may be carried over are separated.

Naphtha plus disulfides is taken off the top of the separator and solution from its bottom is delivered to the lean-solution tank. The lean-solution tank is equipped with a swing line which is employed in removing disulfides and such blending stock as may be carried over into it. A header installed in the tank permits "blowing" the materials contained therein with air when desired.

Dimensions of Major Equipment

The caustic settler is a 72-in. by 20-ft. vessel of the conventional type

(Continued on page 108)



This view of Cities Service Co.'s tannin solutizer unit at Ponca City shows the arrangement of the principal vessels in the process. Of the taller vessels in the foreground the one on the left is the regeneration column and next to it is the extraction tower. The vessel on the extreme right is the settler

MOTORS AND CONTROLS..... FOR Beam-well Pumping

Maximum production with minimum attention to this well is afforded by automatic switch

Several West Virginia operators found that a stripper well which required 12 hours to fill to its maximum head, actually filled to 70 per cent of this in 6 hours. By time-switch control, the well was pumped twice a day—after 6-hour filling periods—instead of just once. It would then deliver 140 per cent (2 × 70 per cent) of that previously produced—a gain of 40 per cent.

by W. G. Taylor*

THE squirrel-cage, three-phase induction motor is almost universally used for beam-well pumping. This motor is available in three types —the normal-torque type, the high-starting-torque type, and the high-slip type. All motors selected should be rated on a continuous basis.

Selection is based on the following factors:

1. Starting torque is rather high and there is usually not much advance information as to how great it will be. The high-starting torque or the high-slip motor is recommended when the motor rating is under 10 hp. For installations of 10 hp. and larger, it is reasonably safe to recommend the normal-torque motor, unless other reasons dictate the use of the other two classes for example, on some specific applications, 10, 15, or 20-hp., when advisable to insure sufficient starting torque. The choice of motor type and size rests with the purchaser, or a specialist, whose decision must be based on local operating conditions.

2. High-slip motors are called for, regardless of all other considerations, when the power supply is privately generated in a small, isolated power plant. These motors keep the current peaks down, thus avoiding unsatisfactory voltage regulation.

3. Some operators desire the cushioning resulting from speed variation. A high-slip motor slows down as the peak load comes on, and thus reduces the peak on the power line by allowing the energy stored in the rotating parts to help carry the peak. The shock load on the mechanical parts remains substantially the same as with other motors, if the same pumping strokes per minute are maintained.

4. Exceptionally high peak loads on each pumping stroke can usually be reduced by proper counterbalancing of the well. In the rare cases where proper counterbalancing does not suffice, such as when the pumping speed is very high, a high-slip motor will reduce the peaks, even though the particular installation does not otherwise call for this type. The best counterbalancing generally gives two equal current peaks on each pumping stroke. If one of the peaks is higher, readjust the counterbalance before considering the use of a high-slip motor.

5. Power consumption with a high-slip motor may be higher, lower, or remain the same. The result depends on conditions at the particular well. If the substitution decreases power consumption, the decrease is small. The ony way to predict the results in advance is to make tests on the individual well, but such tests are usually impracticable. There is no justification for predicting that a high-slip motor will reduce power consumption. In fact, a high-slip motor may slightly increase power consumption, since its efficiency is slightly lower than that of the other types.

Guide to Motor Selection

Single-phase motors are used in some localities where the power comes from single-phase lines. When single-phase motors are applied to oil-well pumping, the factors to be considered are the same as those for three-phase motors. Only one additional factor need be mentioned. The capacitor-type, single-phase motor is preferable to the repulsion type for this service. Repulsion motors have

*Industrial engineering divisions, General Electric Co.

too wide a speed variation under variable loads to be entirely satisfactory for oil-well-pumping service. Furthermore, the commutator and brushes on a repulsion motor require more careful maintenance—particularly in fields where there are occasional sand storms.

The following guide to motor selection covers only the most important considerations. There are many other conditions in oil-well-pumping service which can influence motor selection, especially in borderline cases. It would be difficult to cover fully these other conditions, and no attempt has been made to do so. They are usually obvious to the purchaser, and to any specialist who gives the application careful consideration.

The normal-slip, normal-starting-torque motor is usually recommended when:

The motor size is 10 hp. or more, and

(a) power is supplied from a large generating plant or from the power system of an electric utility,

(b) the wells are properly counterbalanced and paraffin is not excessive.

2, The evidence obtained from tests, or from comparison with other wells, shows conclusively that 150 per cent starting torque will be sufficient.

The normal-slip high-starting-torque motor is usually recommended when:

1. The required motor is less than 10 hp.

2. Existing well conditions are not thoroughly known.

3. There is conclusive evidence that very high starting torque (up to 250 per cent of full-load torque) is required.

The high-slip, high-starting-torque motor is usually recommended when:

1. Power is supplied from a small isolated generating plant. This recommendation holds true regardless of all other considerations.

2. The purchaser desires the additional cushioning effect which the high-slip motor provides, as compares with a normal-slip motor.

3. If, under any conditions, it is desirable to reduce the current peaks.

4. An unusually high pumping speed is required, resulting in very high peaks—for example, when the water/oil ratio is high.

Varying Power Requirement

Where conditions call for higher-than-normal slip, use a high-slip motor (8 per cent to 13 per cent) rather than a medium-slip motor (5 per cent to 8 per cent). The slip permits the stored energy in the moving parts of the rig—including the rotor of the motor—to carry part of the peak load. This reduces the motor peak input. Since there is not much stored energy under any circumstances, what there is should be utilized as fully as possible. Therefore if a high-slip motor is used at all it should have the highest slip available.

Double- and triple-rated motors are used where power requirements vary greatly. On properties where the power requirements of the various wells differ considerably, the operator can use a double- or triple-rated, single-speed motor of the same size on all the wells. The advantages are somewhat better efficiency on light wells, a high power factor on all wells, maximum flexibility in the use of the motors on light or heavy wells, and a minimum stock of spare motors and renewal parts. Double- or triple-rated motors under 15 hp. are considered only occasionally because the gain is small and there is a possibility of insufficient starting torque on the lower ratings. Typical horsepower ratings, usually at 900 or 1,200 r.p.m. in all types, are:

15/10/6 hp.	30/21/12 hp.
20/14/8 hp.	40/28/16 hp.
25/17/10 hp.	50/35/20 hp.

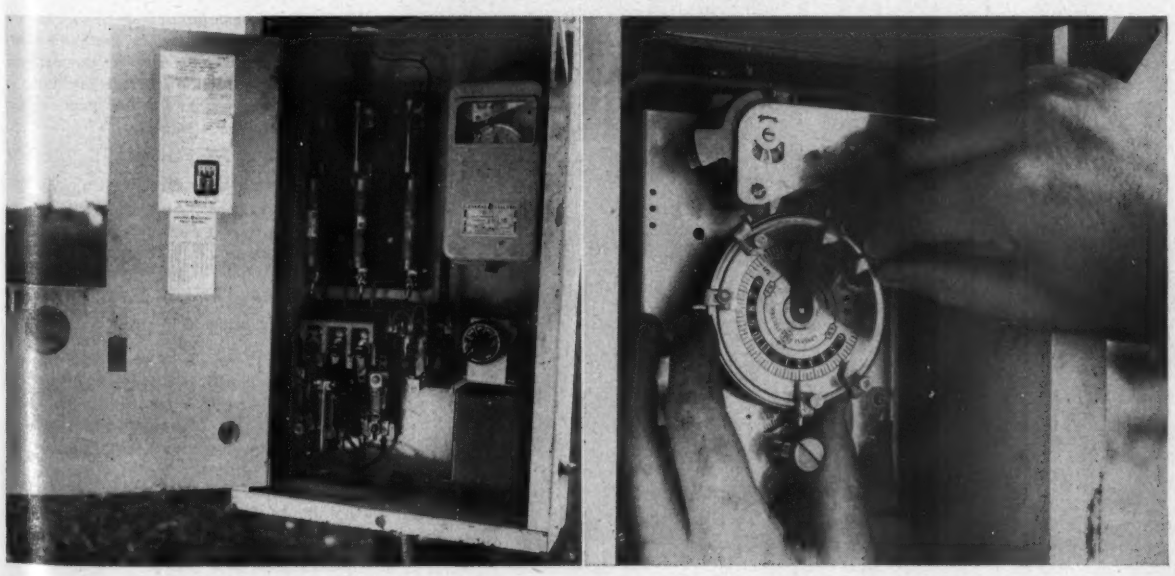
In the initial stages of pumping, where reservoir pressure from gas or water helps to lift the oil, and where production may also be limited by proration, the lowest motor rating is used for the low power requirements. As reservoir pressure declines, or as greater production is allowed, the intermediate motor rating is used. Eventually, the highest rating is used for full production. The highest rating may also be used for driving a friction-clutch rod and tubing hoist. The double-rated motor is the same as the triple-rated, with the intermediate rating omitted.

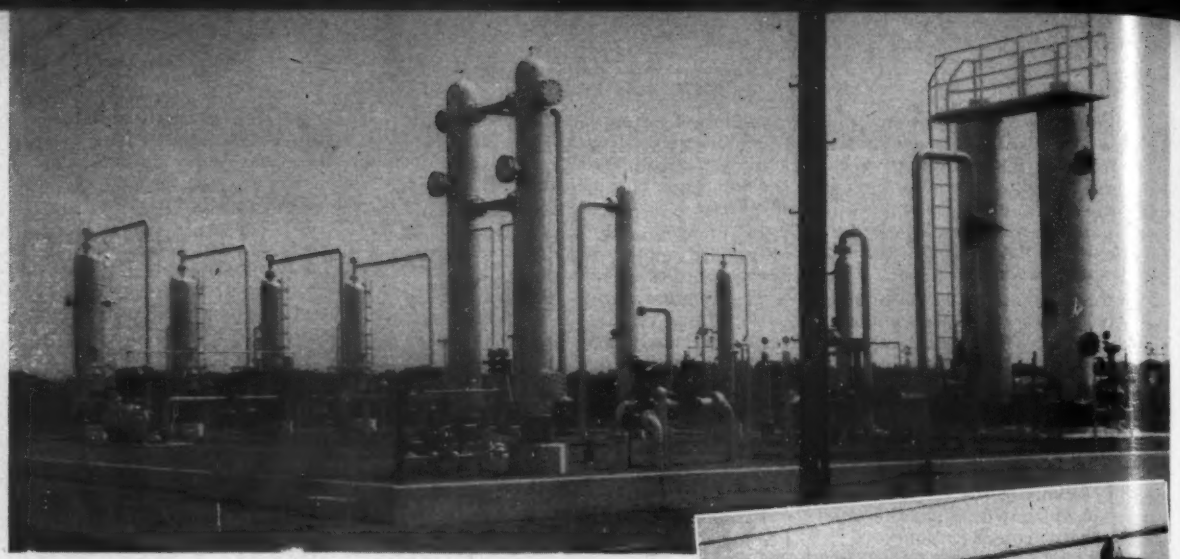
Operating conditions govern motor enclosure. Oil-well pumping motors are available with dripproof, splashproof, totally enclosed fan-cooled, and explosionproof housings. If the moist weather conditions are not too severe, splashproof motors are suitable for out-of-doors service. Under severe weather conditions, the totally enclosed, fan-cooled motor will give longer service than the splashproof motor. Explosionproof motors are not normally required for well-pumping service because the well is capped when the motor is operating, and the motor is shut down when the well is open.

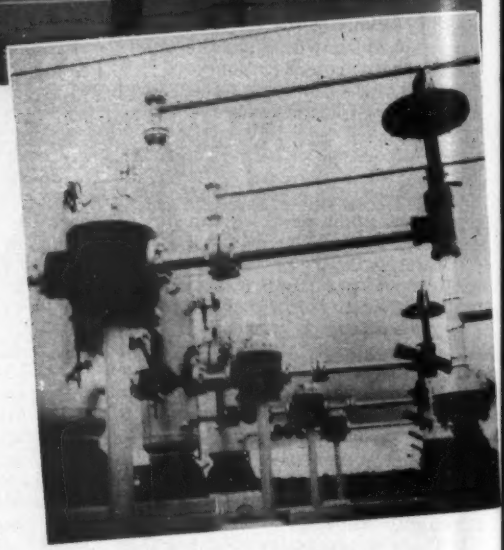
The control equipment for an oil-well motor for beam-pumping is assembled as a unit in an outdoor case arranged for pole-mounting. The case is ventilated to keep the sun from

(Continued on page 113)

Left: This electric control unit for beam pumping contains a fused line switch, a motor-starting magnetic switch, selector switch for either manual or automatic starting and stopping, an undervoltage protective relay, temperature overload relays, and a service protector for lightning protection. Right: Closeup of automatic time-switch indicating and adjustment dial







Compact Plant

Dehydrates Gas and Meters Distillate

by E. H. Short, Jr.

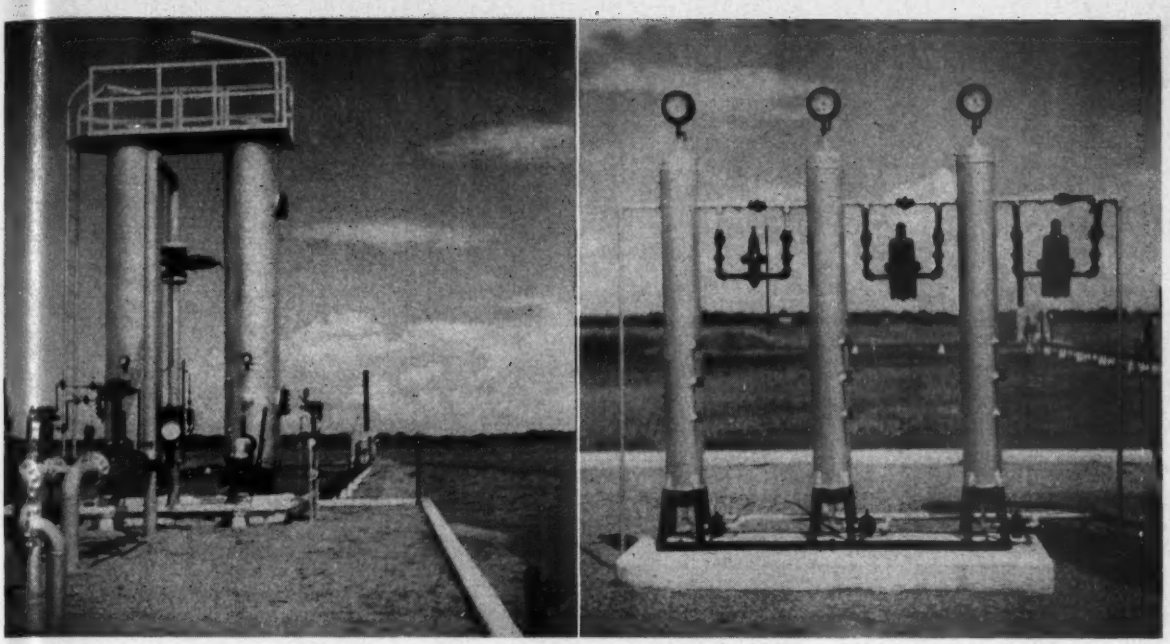
Top of page: Continental-Naylor gas dehydration and metering installation on H. M. Naylor Oil Co.'s Acadia Development Co. lease near Mermentau, La. Gas-distillate, heated to 70° after passing through chokes, enters plant through the four separators at extreme left. Contactors are on extreme right. Sand and water traps in center foreground

Above: Meter installations on separator discharge lines. Left: Specially designed blowcase prevents pressure drop on downstream side of meters. Standing beside blowcase is Sidney Seagraves, production superintendent for H. M. Naylor Oil Co.

IN Southwestern Louisiana, Continental Oil Co. has had in operation for some time, several compact, well-arranged dehydration and metering setups. There are plants in Reddell, Lake Arthur, East Moss, and Mermentau fields. Gas and distillate handled by these plants goes to the Continental Gillis gasoline plant northeast of Lake Charles.

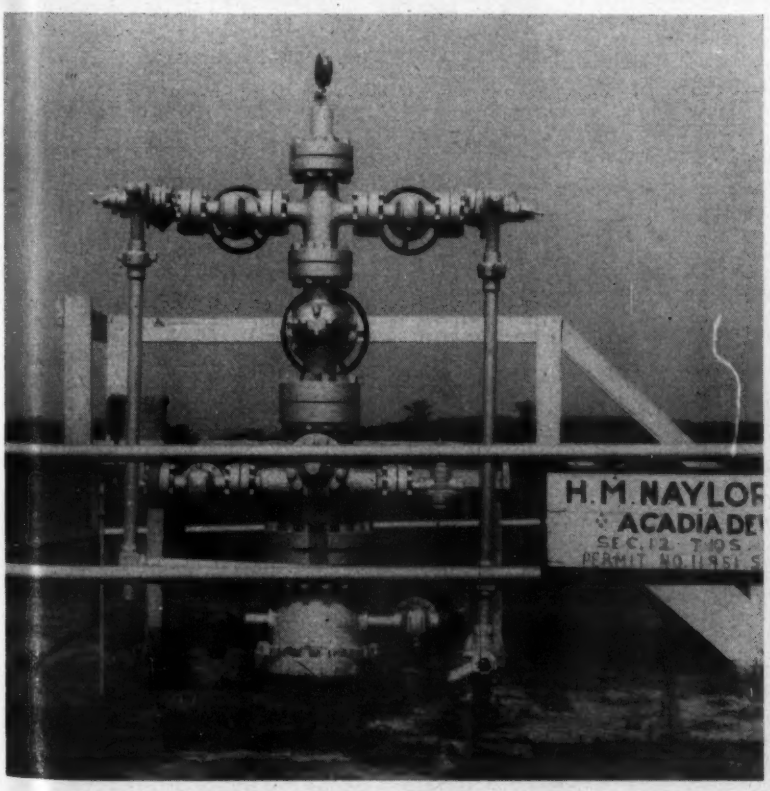
Typical of these plants is the one located on H. M. Naylor Oil Co.'s Acadia Development Co. lease in West Mermentau field. This plant handles gas and distillate from 3 Naylor wells and gas from 13 Continental wells.

The Naylor wells produce from a



Left: Closeup of Florite contactors. Heater in center background heats drying gas to 550° F. Each contactor contains 10 ft. bed of Florite. Right: Instrument gas scrubbers and pressure-reduction chambers

10,000-ft. zone with well-head pressures ranging from 2,500 to 4,800 psi. Before the gas from these wells enters the plant it passes through chokes which reduce the pressure to approximately 750 psi. The gas distillate is then passed through heaters which raise the temperature to 70° F. From these heaters the gas goes through a battery of separators. The distillate leaving the separators passes through positive-displacement meters, thence to a common line tied into a blowcase. The blowcase maintains a pressure on the downstream side of the meters equivalent to that on the upstream side. From this point the distillate passes through a water trap, then it goes directly into the Continental's 8-in. main line to the Gillis gasoline plant. The Naylor wells produce approximately 300 bbl. of 54°-gravity distillate a day. Once a month the production is routed to a 1,000-bbl. test tank, before being turned into the main line, in order to recheck the meter correction factor.



Typical well head assembly used on H. M. Naylor wells

Gas Dehydrated

Gas production from the separators is metered and then passes through a 16-in. by 12-ft. scrubber before going into the main gathering line. During cool weather, or from October to April, the gas is dehydrated by passing it through a 32-in. by 16-ft. desiccant contactor.

When the contactor in operation has become saturated, the gas is switched over to another contactor. The saturated contactor is then dried by passing hot gas through it for a period of about 3 hours. The hot gas (550° F.) is supplied by a heater located a short distance from the plant.

Gas from the 13 Continental wells which goes through the Mermentau plant enters through a 7-in. line at 750 psi. It has already been stripped of oil and all possible water before entering the plant for more complete dehydration. At the present time this plant is handling a total gas volume of approximately 13,000,000 cu. ft per day.

Reconditioning Heater Tubes At Gulf's Port Arthur Plant

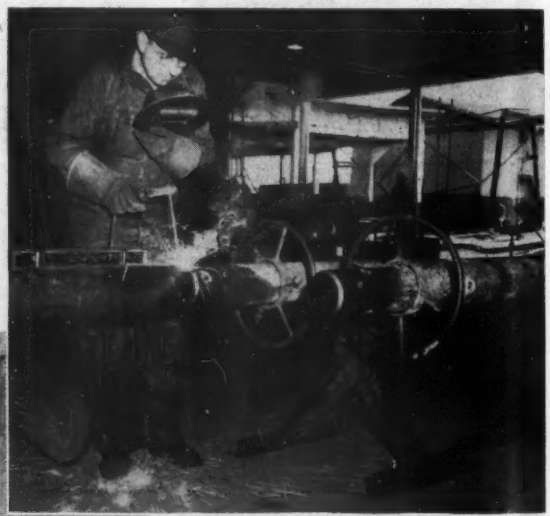
by R. B. Tuttle

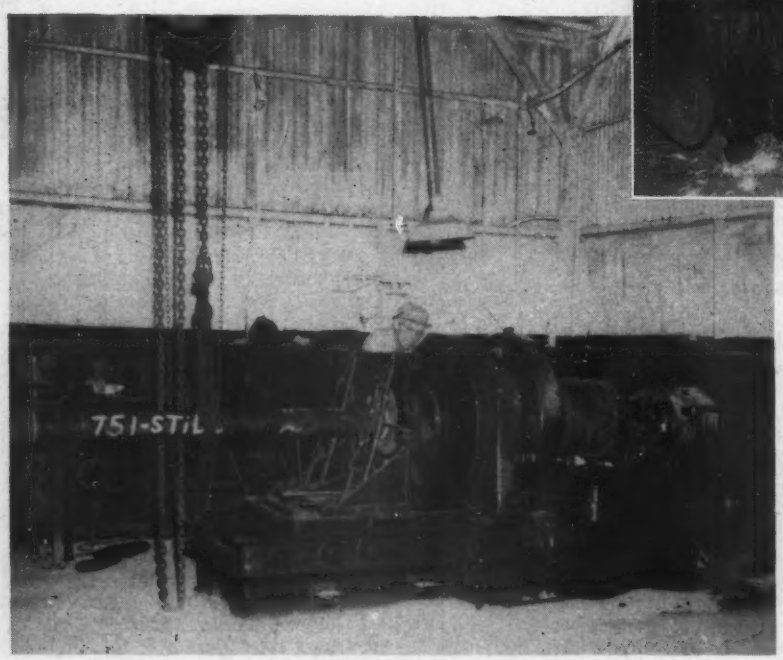
TUBES which have been retired from fired-heater service may often be reconditioned economically for other services where operating conditions are of lesser severity. For example, radiant-section tubes operating in cracking service, on retirement from that service, may be suitable for long-period operation in the convection section of the same heater. These same tubes when retired from service in the cracker's convection section may serve for a number of years in a topping heater or other light operations. This plan is carried out successfully in a large number of the country's refineries. In those plants where this "step down" method is employed extensively, investigation reveals that a carefully conducted, long-range program, which may go back as much as 15 or more years, is economically sound. In other refineries where the methods are employed to a lesser extent, because of mechanical or structural difficulties encountered in stepping down from one type of heater to another on from one service to another, the method is still shown to be economical to a limited degree.

Aside from working out the problems involving tube dimensions and physical and chemical properties as related to structural and service conditions, another problem requires solution before a tube salvage and reclamation project may provide maximum gains. This latter problem is relatively simple since it concerns only methods and procedures involved in the actual reconditioning of tubes. In those refineries where step-down methods are employed, much, if not all, of the work of reconditioning is carried out in connection with the plant's pipe-fabricating shop.

Typical of the refineries employing modern facilities and techniques for reconditioning heater tubes is the Port Arthur plant of Gulf Oil Corp. Operated under the supervision of the refinery's pipe-fabrication shop, which is a unit of a vast maintenance setup at Port Arthur, the tube-reclamation section is equipped to repair and alter, when needed, any of various heater tubes used in the refinery without limitation as to their size and chemical composition. In cooperation with the inspection department, all tubes entering the reclamation shop are given permanent identification symbols which are keyed into records showing physical and chemical properties, original and current dimensions, thus providing an up-to-the-moment history of any given tube. When tubes which have been previously identified enter the shop, their history and dimensions are incorporated into the record file after such work as may be required is completed.

All tubes upon which welding operations have been performed in the process of reconditioning are heat treated as required. The pipe shop's regular furnace is used for the operation. Furnace temperature is regulated automatically and a complete record showing rate of heating, length of time the peak temperature was maintained, and rate of cooling is made of each furnace charge. Procedures employed in heat-treating operations coincide with those for pressure vessels of comparable car-





Above: Here an operator is tack welding together two sections of tubing, one of the several steps required when salvaging tubes are lengthened. During final stages of welding the operator employs a helmet-type shield to free his hand for use in rotating the tube

Left: Developed for facing, turning, and boring flanges which have been welded to various lengths and shapes of fabricated piping, the machine shown here is a converted standard threading machine. In this operation the work is stationary and the cutting tools rotate

bon steel or carbon-steel alloys and also the chromium and chromium-nickel groups.

Except for filling in telltale holes, welding operations are not made on any of the tubes for the purpose of repairing probable or actual leaks. Before welding, all telltale holes are reamed and cut to a depth slightly below the bottom of the original holes. Alloy filler metal is used normally for plugging the reamed holes and the metal is deposited with a slight overlay approximately ½ in. in diameter, centered on the filled hole.

Tubes which require lengthening are spliced at one end and the joint welded according to standard procedures. The welding groove at the spliced joint is prepared by machine beveling the ends of each tube to an angle of approximately 30°. When fitted up the two ends for a welding groove of some 60° included angle. A cast-iron ring approximately ½ in. long, ¼ in. thick and turned to the inside diameter of the tube serves as a fitup fixture and for welding backup. Alignment is maintained to sufficient accuracy by placing the longer section of the tube on leveled supports, positioning the shorter section over the extended portion of the fitup ring, leveling the section in two planes 90° apart with a hand level and then tack welding the sections at two points in each plane. After tack welding, the section is checked again for alignment.

The supports on which fitup and tack welding are made are used in the final welding operations, which are carried out normally in three or more bead passes. In making the first pass the tube metal is burned through to the backup ring sufficiently to insure complete penetration on the inside edges of the tube ends, but exercising care to prevent incorporating cast iron into the molten weld metal. Complete penetration is also obtained on all surfaces in the second pass. Overlay of the third or last pass is held to a minimum since it must be removed by grinding to avoid interferences when installing the tube in hangers and the like.

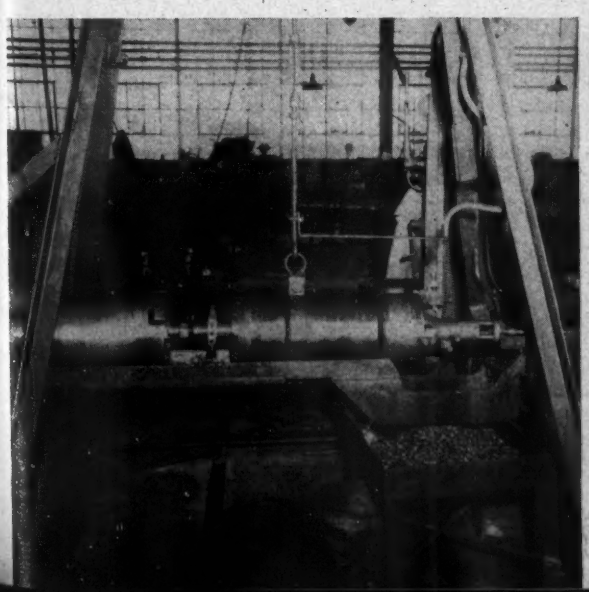
During welding operations the tubes are rotated by means of hand wheels especially constructed for the purpose. These wheels are held in position on the tube by means of three compression screws, two of which have hexagon heads and lock nuts for wrench operation and the third arranged with a tee head for hand operation. For any given size of tube the hexagon-headed screws are adjusted to the desired length and their lock nuts wrenched firmly so that the screws will not work loose during operations. When installing or removing the wheels from the tube only the tee headed screw is used for tightening or loosening the wheel's grip on the tube. Rotation of the tube on its stand requires little effort since the supporting rollers are equipped with antifriction bearings; supports and bearings both are shop fabricated. Tube rotation during welding operations is performed by the welder.

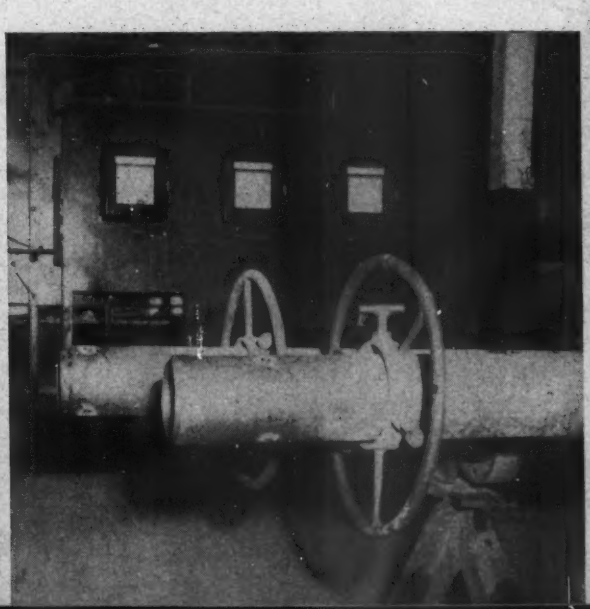
After completion of the circumferential butt weld, the backup ring is removed and the tube made ready for heat treating. Normally a large number of tubes are processed through the furnace at one time. Those tubes having lengths which exceed that of the furnace and which need treating over the entire length are passed through the operation in two steps wherein part of the length of the tube is heat treated in each step. Time and temperature conditions are the same for each of the two steps, and in order to insure treatment of the tube's entire length each part placed in the furnace includes more than half of its total length. Although tubes processed in this manner are heat treated twice in the region to overlap near the center of their lengths no damage results therefrom.

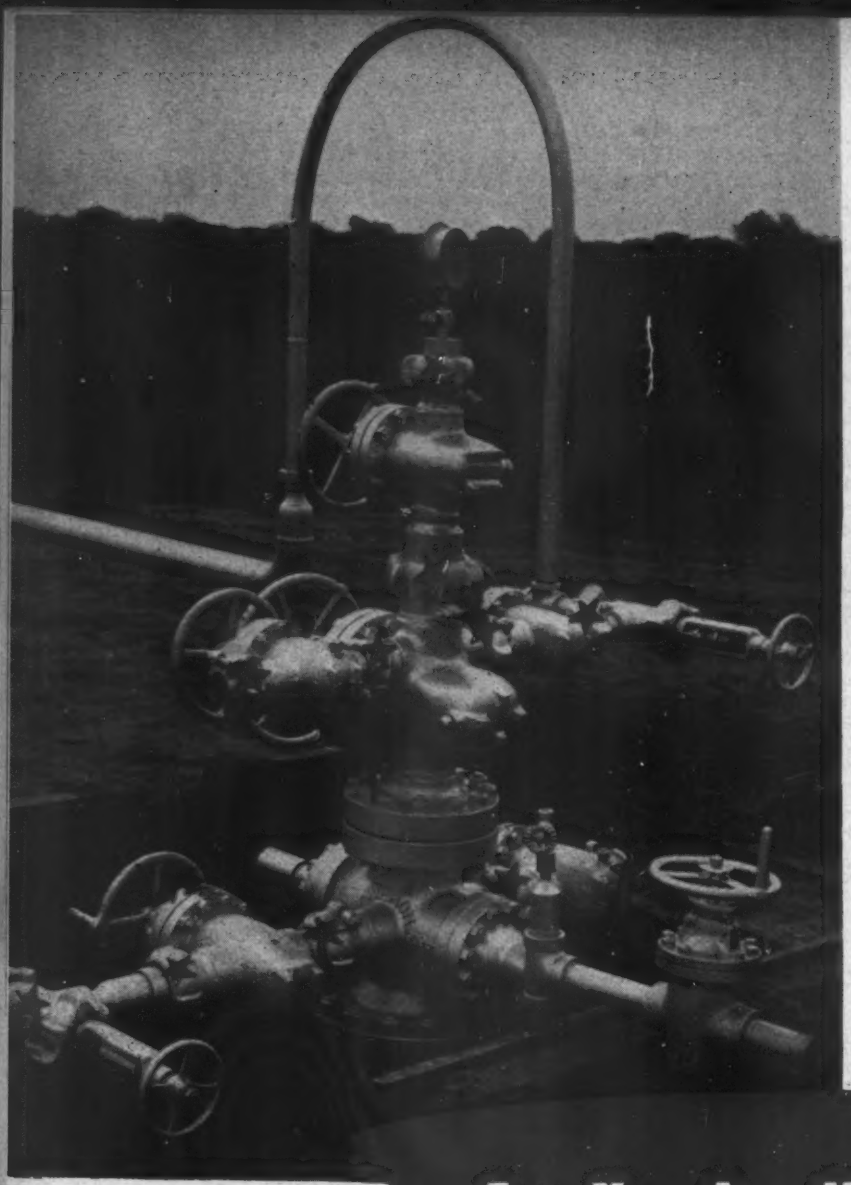
Other work carried out on heater tubes in the pipe shop includes a special machine operation on upset ends. The machine on which this operation is performed was developed and built in the pipe shop several years ago. Equipped with an air-motor drive, the machine is self-feeding and operates to face and turn accurately the upset ends of certain tubes used in the refinery. One of the accompanying photographs shows the machine before attaching to a tube. Since both facing and cutting tools are installed in the machine's working head, all operations on the tube end are performed simultaneously. Time required for setup and for machining completely one tube end is but a matter of minutes.

Machining work for much of the fabricated piping handled through the shop consists principally of facing, boring, and turning flanges after they have been welded in place on the pipe. The machine used for this work is shown in one of the accompanying photographs. Because of shape and length of many of the fabricated sections requiring facing and other operations the machine is built so that its cutting tools rotate. For boring operations the tool holder, similar to an ordinary boring bar, is chucked and the work fed to it. Turning and facing tool holders are chucked also and the work fed to them in the same manner as employed in boring operations. Work is held in an especially constructed holder which is screw fed by hand and travels along the machine's ways. All of the various tool holders and the traveling stock which carries the work were developed and constructed in the company mechanical shops.

Left: This device is employed for machining upset tube ends. Normal operations for the machine consist of facing and turning only the upset portion of new tubes. Self feeding, the device is powered with an air motor. Right: Near the ends of the two tubes shown here may be seen the weld overlay on plugged tell-tale holes. The large wheels clamped around the tubes are used by the operator for rotating a tube during final welding operations. Control panel for the heat-treating furnaces may be seen in background







CHRISTMAS TREE NEED NOT BE BIG & HEAV TO BE STRONG AND SAFE

E X A M P L E

The use of UNIBOLTS instead of flanges on this tree saved more than 1000 lbs. of steel and increased the safety factor.

MUD VALVES CAN BE MADE LIGHTER AND STRONGER, TOO, LIKE THIS

This is the "UNIBOLT TREE" . . . so named because all of its valves and fittings are equipped with UNIBOLT Couplings rather than flanges. Obviously, since there are no heavy, bulky flanged connections, these trees save an appreciable quantity of steel, but of greater importance is the fact that the UNIBOLT design places a much larger section of metal in shear for each square inch of area exposed to pressure, resulting in a substantially higher factor of safety.

UNIBOLT Couplings are available for either butt or socket welding. They may be easily welded to the hubs of any steel valve. Complete interchangeability and the one-bolt design facilitates their assembly in Christmas tree manifolds.

Ask your supplier to furnish UNIBOLT-equipped trees . . . your assurance of minimum bulk and weight and greater safety.

THORNHILL-CRAVER COMPANY

HOUSTON, TEXAS

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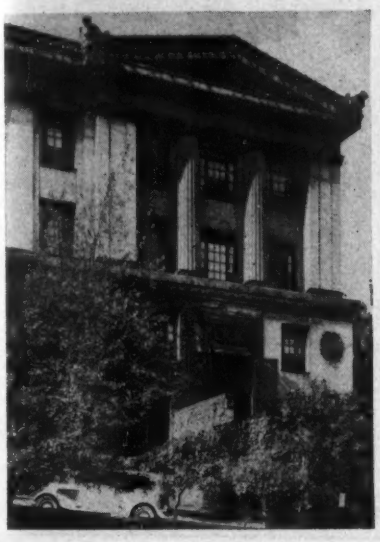
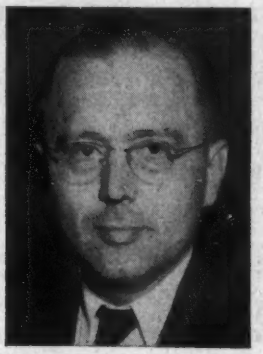
PETROLEUM ENGINEERING SCHOOLS

NO. 2 IN A SERIES

UNIVERSITY OF PITTSBURGH





H. T. Botset, head, petroleum engineering department, University of Pittsburgh
Left: State Hall, University of Pittsburgh, which houses the petroleum engineering department

SALIENT FACTS AND FIGURES

General: Founded in 1787, 11 years after the signing of Declaration of Independence. Coeducational, privately controlled, state aided. Located in Oakland district of Pittsburgh, in the civic center. Includes 11 schools and divisions, and Alleghany Observatory, Mellon Institute of Industrial Research, Research Bureau for Retail Training, and the Bureau of Business Research. Library contains over 350,000 volumes.

Buildings and grounds: Campus contains 77 acres. Main building is 41-story Cathedral of Learning.

Tuition: Student assessed $10 for each semester credit. Normal undergraduate schedule will average $300-320 per year.

Calendar: Year's program includes: fall semester, spring semester, and summer session.

THE petroleum engineering department of University of Pittsburgh is credited with being the oldest department in the United States, having been founded in 1912. Three degrees are granted by the school—b.s. in petroleum engineering, b.s. in geological engineering, and m.s. in petroleum engineering. The regular undergraduate curriculum requires 4 years to complete.

Holbrook G. Botset is head of the petroleum - engineering department and Elmer A. Holbrook is dean of engineering and mines. Botset has a B.S. degree in chemical engineering from Purdue University and 17 years of professional experience with Gulf Oil Corp. Other members of the petroleum engineering staff are Paul F. Fulton and Bernard E. Curran. Fulton has a B.S. in petroleum engineering from Pitt and worked for The Texas Co. prior to becoming an instructor. Curran is assistant director of research for Spang-Chalfant, Inc., tubular-goods manufacturers, and lectures part time at the university.

For the school year of 1946-47, the department had a total enrollment of 128 students, with a class breakdown as follows: freshman, 27; sophomore, 40; junior, 29; senior, 21; and graduate students, 11. This past year's enrollment figure compares with 11 for 1945-46, and 118 for 1940-41, the last prewar school year. The estimated average starting salary of the 1947 graduate with a B.S. degree was $240.

The curriculum emphasizes fundamental engineering principles, with special attention to basic courses in mathematics, chemistry, physics, thermodynamics, geology, hydrodynamics, and metallurgy, given by the respective departments in the university. Departmental courses in petroleum, which are designed to emphasize application of engineering fundamentals to various aspects of this field, are given largely in the senior year.

Four Laboratories

The department has four laboratories concerned with petroleum-engineering subjects—the petroleum testing laboratory which contains equipment for performing all standard A.S.T.M. tests; the mud laboratory with equipment for standard mud tests; the core-analysis laboratory; and the gas laboratory with various types of gas meters, regulators, other appliances, and equipment for calibration and testing.

Location of the university permits specialists in the fields of geology

(Continued on page 109)

Student measuring mud viscosity with Stormer viscosimeter in mud laboratory at University of Pittsburgh

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PATENT NOTICE: The method of perforating tubing and the Kinley Gun Perforator are fully protected under U. S. Patent No. 2,426,106, of August 19, 1947.

Low-Cost Injection Program Started in Texas Panhandle

by Leigh S. McCaslin, Jr.

BASED upon a successful 6-month trial period, the Railroad Commission of Texas has approved a co-operative gas-injection program for the 600-acre McConnell area of Panhandle field of Texas. A feature of this program is the low-cost operation made possible by a favorable pressure differential between the gas-source wells and the input wells. Input-well pressure is sufficiently lower than that of the source wells to enable injection without the use of compressors.

The program will affect 23 oil wells and 7 gas wells owned by the following nine operators: Stanolind Oil & Gas Co.; The Texas Co.; Texwell Oil Co.; Shell Oil Co., Inc.; Herrogan Oil Corp.; Cady & Co.; Kewanee Oil Co.; Washoma Petroleum Co.; and A. M. Solow, agent. The injection of 100,000 cu. ft. of gas per day into each of six input wells in the area is permitted by the commission order. Current production in the field averages about 225 bbl. per day, for all operators, with an estimated gas-oil ratio of 605 cu. ft. per barrel. Gas for the injection program is to be obtained from source wells in the field.

Geology

The McConnell area is on the southwest edge of the Panhandle field at the Gray-Carson county line. Production is from granite wash which dips from southwest to northeast in this area. The wash is very permeable and usually produces prolifically. The reservoir is characterized as a spotty reservoir rather than continuous. This is caused by secondary cementation of shale. Generally the granite wash must be penetrated about 50 ft. before production is reached. This top 50 ft. is composed of a fine limy pink granite wash capped by a very arkosic limestone.

Experimental Injection

About 1944, a rapid production decline in Panhandle field caused the operators to become interested in the use of gas injection for arresting the decline. As a result, the West Pampa project[1,2,3] was organized covering a large part of the field, but not the entire field. The McConnell area is one of those in the field not included in the West Pampa program.

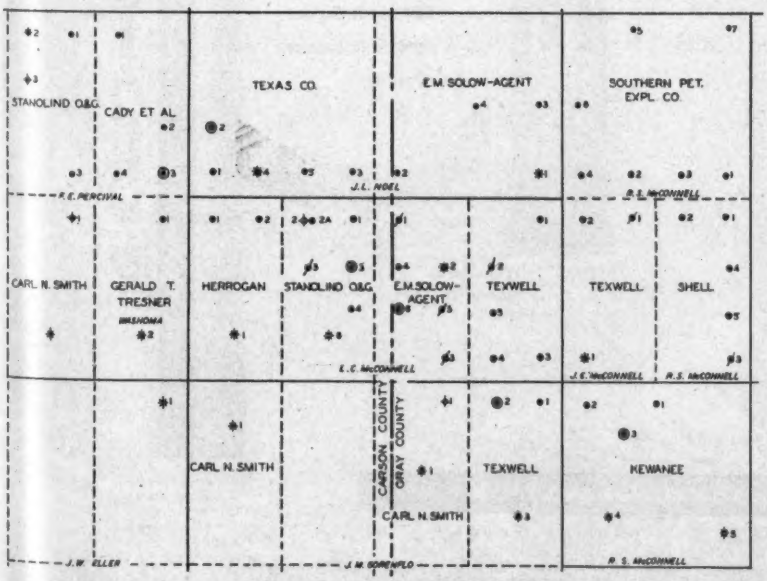
The Texas Co. was the first operator to commence experimental gas injection in the McConnell area. In 1945, this company decided to put gas directly into an injection well from one of the sweet-gas wells in the area. Objective of the test was to determine if it was possible to obtain gas in this manner and inject it without installing compressors.

Gas was taken from The Texas Co. 4 Noel, a dolomite gas well with a shutin pressure of about 185 psi., and injected into 5 Noel, a granite wash well with a shutin pressure of about 85-90 psi. Volumes injected varied from 10-119 M.c.f. per day and the top pressure reached was 170 psi. The tests were successful in that they proved that the pressure differential existing between the wash and the dolomite would permit natural injection at practically no cost.

Stanolind Starts Injection

In November 1946, Stanolind commenced injection in 3 McConnell, and by February 1947, Texwell and Kewanee were also putting gas into one well each. By this date, The Texas Co. was using its 2 Noel for an input well in place of the 5 Noel which was used for the early experimental work. By the end of June 1947, these four operators had injected gas equivalent to 529,361 bbl. of reservoir space as occupied by the oil. During this same period, the cumulative withdrawals were only 436,562 bbl. of reservoir space. Hence the gas injection up to June of this year was 121 per cent of the withdrawals based on reservoir volumes.

June figures will give an indication of the scope of the injection program as already under way prior to the issuance of the commission order authorizing an area-wide program. The four input wells took a total of 5,788 M.c.f. during the month for a daily average injection of 193 M.c.f. Well-head injection pressures varied from 77-141 psig. in the four wells. A gas equivalent of 95,971 bbl. of reservoir space was injected while withdrawals were the equivalent of 61,263 bbl.



Lease map of the McConnell area showing the six input wells to be used in the injection program. A total of 600 M.c.f. of gas per day has been authorized for injection by the Texas Railroad Commission

References

1. "Mammoth Gas-Repressuring Project to Start in West Pampa Pool," Kenneth B. Barnes, The Oil and Gas Journal, February 10, 1945, p. 74.
2. "11,667 Productive Acres Repressured in West Pampa Cooperative Project," Kenneth B. Barnes, The Oil and Gas Journal, November 9, 1946, p. 66.
3. "Expanded Plant at West Pampa Plays Dual Role," Arch L. Foster, The Oil and Gas Journal, November 9, 1946, p. 72.

Canadian May Products Output Shows Increase

Canadian production of refined petroleum products for May showed an increase of 600,927 bbl. over the same period last year, and for the first 5 months an increase of over 2,000,000 bbl. over the 5 months of 1947. The 5-month total for 1947 was brought to 26,730,231 bbl. with May's output of 6,835,726 bbl.

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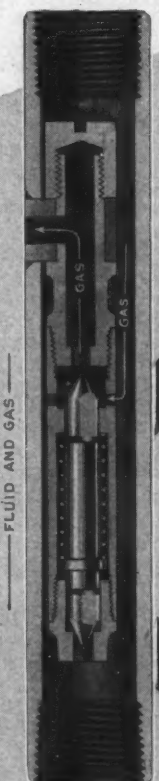

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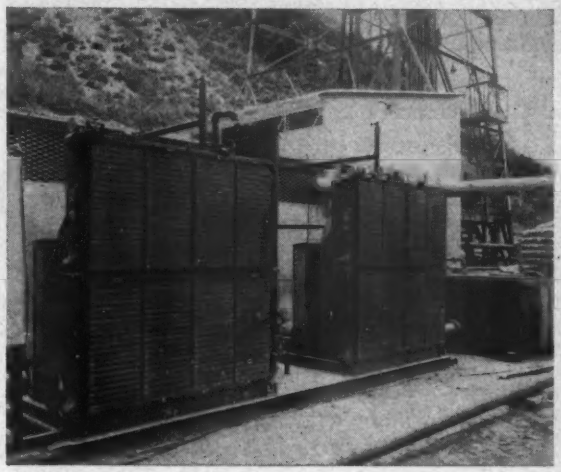
Separate COOLING on Drilling Rigs

RECENTLY in California there has been put in operation a drilling rig which employs remote-type jacket water coolers instead of engine-mounted radiators. The principal objection to the separate coolers in the past has been that they constitute another piece of equipment to be moved every time the drilling rig is moved. There are, however, advantages offsetting this point.

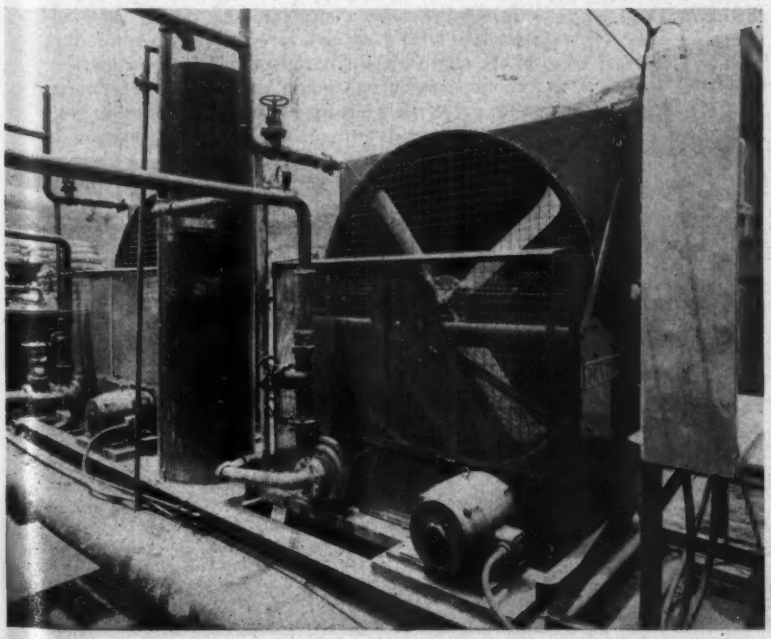
Principal advantage is the power savings in fan loads. Taking, for perhaps an extreme example, a case where ten 150-hp. engines are used, and assuming several horsepower fan load per engine if fans were on the engines, this would release a substantial amount of horsepower to apply to the drilling rig. The separate cooler, in contrast, uses only eight fan horsepower. The cost of the engines in terms of "cost per horsepower" is thus substantially reduced, or on a cost-per-horsepower basis, several additional horsepower per engine has been purchased, not only without additional cost, but actually at a lower price because the engine manufacturer would make an allowance for deduction of the radiator from the power unit. Naturally the cost of the separate coolers has to be considered in the over-all cost consideration, but the point is that more horsepower is available for the rig, and the cost of the separate coolers is largely offset by omission of engine radiators and fans.

The removal of the cooling units from the rig means a removal of a great deal of heat within the rig, which often is an objectionable feature on engine-powered rigs. The engine radiators do not have access to unheated air, frequently at least, and the heat is objectionable to the crews in hot weather.

Use of the separate coolers, located outside the rig, also removes the noise of high-speed fans from the rig; this noise reduction is considered a good factor by the safety departments of the drilling and oil companies.



These jacket water coolers (Young model 232) are on a new rotary rig owned by Bell Burden, drilling contractor of Los Angeles. The coolers handle the jacket water and also cool the circulated lubricating oil. The cooler units are on separate skids and are easily moved



Elimination of the engine fans makes possible more efficient maintenance of the engines because the mechanics can detect engine noises and locate trouble more efficiently without fan noise and the fan blast passing over them while working.

By having water pumps on the separate coolers, a constant flow of water can be distributed to all engines regardless of engine speed and engine-pump performance. This, together with automatic shutter use on the separate coolers, obtains an abundant water supply to all engines at a constant temperature, resulting in lower temperature rise through engines.

The separate coolers can be tied in to the cooling circuit of either the hydromatic or electric draw-works brakes, thus dispensing with cooling tower or with other cooling equipment used for that purpose.

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Dual-zone well installation for flowing upper producing horizon by gas injection. Auxiliary 1-in. tubing string, set in special tubing-head at top, is used to flow lower-zone production. Gas is injected through wing (left side) of intermediate 2-in. tubing head into annulus of 1 and 2-in. tubing strings, and thence through orifice button in wall of 2-in. tubing to annulus of 2-in. tubing and 5½-in. casing. Upper zone flows through casing (bottom wings)

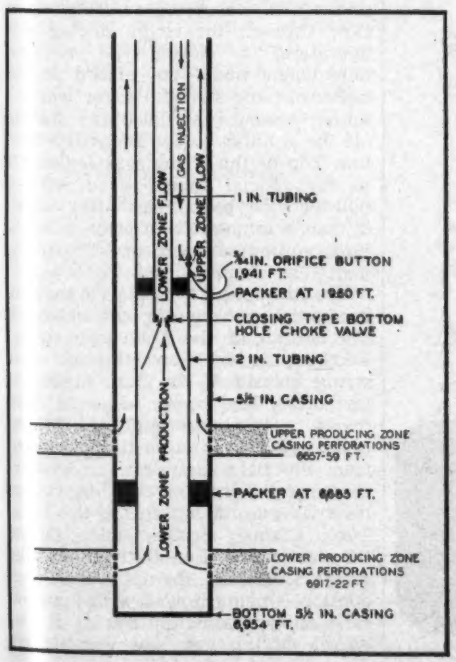
Chicago Corp. Successfully Performs Remedial Work On Dually Completed Wells

by Neil Williams

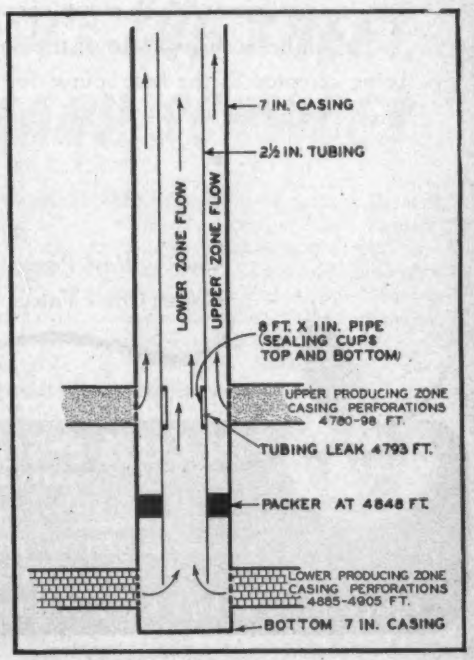
SEVERAL remedial jobs involving dually completed wells recently have been performed successfully by Chicago Corp. in which the objectionable necessity for killing the wells and pulling tubing and packer was avoided. By the unusual procedures followed, substantial savings in cost and time were realized. Since killing a well entails risks of not being able to bring it back in as good as before, the benefits may have been more than the actual savings in time and cost of the jobs.

One of the jobs concerned a well, located in Deep Saxet field in Nueces County, South Texas, in which the upper of the two producing zones had ceased to flow because of water intrusion. Since this zone still carried considerable recoverable oil it was not desired to abandon it. At the same time, in view of the continued good production from the lower zone, it also was not desired to kill the well in order to rework the upper zone in an attempt to shut off the water. As an alternative, it was decided to attempt a plan to flow the upper zone by gas lift.

As in most dually completed wells, the upper zone is produced through the annulus of the tubing and casing


GAS INJECTION
LOWER ZONE FLOW
UPPER ZONE FLOW
1 IN. TUBING
⅜ IN. ORIFICE BUTTON 1,941 FT.
PACKER AT 1980 FT.
CLOSING TYPE BOTTOM HOLE CHOKE VALVE
2 IN. TUBING
5½ IN. CASING
UPPER PRODUCING ZONE CASING PERFORATIONS 6857-59 FT.
LOWER ZONE PRODUCTION
PACKER AT 6885 FT.
LOWER PRODUCING ZONE CASING PERFORATIONS 6917-22 FT.
BOTTOM 5½ IN. CASING 6,954 FT.

Left: Generalized subsurface diagram of dually completed well with auxiliary 1-in. tubing-string setting for producing upper zone (flowing through casing) by gas lift


7 IN. CASING
2½ IN. TUBING
LOWER ZONE FLOW
UPPER ZONE FLOW
8 FT. X 1 IN. PIPE (SEALING CUPS TOP AND BOTTOM)
UPPER PRODUCING ZONE CASING PERFORATIONS 4780-98 FT.
TUBING LEAK 4793 FT.
PACKER AT 4848 FT.
LOWER PRODUCING ZONE CASING PERFORATIONS 4885-4905 FT.
BOTTOM 7 IN. CASING

Right: Schematic diagram showing means of repairing leak in tubing of dual zone well without pulling tubing and packer

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with a packer sealing the annulus between it and the lower zone, which flows through the tubing. In this well, 5½-in. casing was cemented at 6,959 ft. The lower zone produces through perforations at 6,917-22 ft., and the upper zone at 6,657-59 ft. Packer is set at 6,685 ft., with 2-in. tubing being used.

The plan called for running a string of 1-in. pipe with packer inside the 2-in. tubing, and, by means of an orifice button in the tubing wall above the packer, injecting gas through the annulus of the 1-in. and 2-in. strings into the annulus of the 2-in. tubing and 5½-in. casing, through which the upper zone is produced. With this installation, production from the lower zone then would flow through the 1-in. string.

Flow and pressure from the lower zone were shut off while changing surface connections and installing snubbing equipment for running the 1-in. string by means of a 2-in. tubing plug, which was set at a depth below where it was desired to insert the orifice button in the tubing wall. The master valve, with the upper well connections, then was removed, and a special, small-sized tubing head body for the 1-in, pipe flanged on top the 2-in. tubing head. On this, conventional Otis snubbing equipment was installed to run the small pipe.

Preventing Unwanted Flow

With this done, and the pressure from the lower zone still shut off by the tubing plug, a 5/64-in. orifice button was inserted through the tubing wall at a depth of 1,941 ft. The tubing plug then was pulled to open the tubing and permit running the 1-in. pipe, which was snubbed in under 1,300 psi. pressure. To prevent flow through the string during this operation, a closing-type bottomhole choke body was placed in the bottom of the string. Packer was set under pressure at 1,960 ft., sealing off the annulus below the orifice button. Top of the string was sealed off in the special tubing head with a boll-weevil-type hanger, after which it then was possible to remove snubbing equipment and install permanent flow connections.

The lower zone was placed back on production by opening the choke in the bottom of the 1-in. pipe string, allowing it to flow through this string instead of the 2-in. tubing as formerly. The upper zone is produced as before through the 5½-in. casing. Gas to lift this fluid is taken from the field high-pressure system. It is injected through the 2-in. tubing head wing to the annulus of the 1 and 2-in. tubing strings, and thence through the orifice button into the casing. Currently, the upper-zone production is being flowed with a gas-oil ratio of approximately 800 cu. ft. per barrel. Of this gas, however, 400 cu.

ft. per barrel is solution gas, so that only 400 cu. ft. of extraneous gas is required per barrel of production.

In another remedial job involving a two-zone well in Stratton field, also in Nueces County, South Texas, Chicago Corp. was able to save itself from having to kill the well and pull tubing and packer by an improvised repair of a tubing leak which had resulted in communication between the two producing zones.

Before it was learned that there was a leak in the tubing above the packer separating the two zones, it had become apparent from observation of production that communication existed between the zones. Generally, the first thought in such cases is that the trouble lies in the packer, and an operator then usually will proceed immediately to kill the well and pull the tubing and packer.

Sometimes, after pulling packer, it is found, however, that the trouble is not in the packer but rather is due to a leak in the tubing. Consequently in this case, to avoid killing the well and pulling the tubing and packer unless necessary, it was decided first to test the tubing and determine whether the trouble actually was in the packer or whether it was due to a leak in the tubing.

The well is one which the operators especially did not wish to kill. The lower zone is a tight formation which had been acidized, and since an acidized formation is particularly susceptible to deep penetration of the mud used in killing the well, it was feared that any further attempts to reacidize it to restore production might be ineffective.

In completion of the well 7-in. casing was set and cemented through the producing zones and perforated at 4,885-4,905 ft. for the lower zone and at 4,780-98 ft. for the upper zone. The zones are separated by packer set at 4,848 ft., using 2½-in. tubing to flow the lower zone, and the annulus of the tubing and the 7-in. casing for the upper zone.

Testing the Tubing

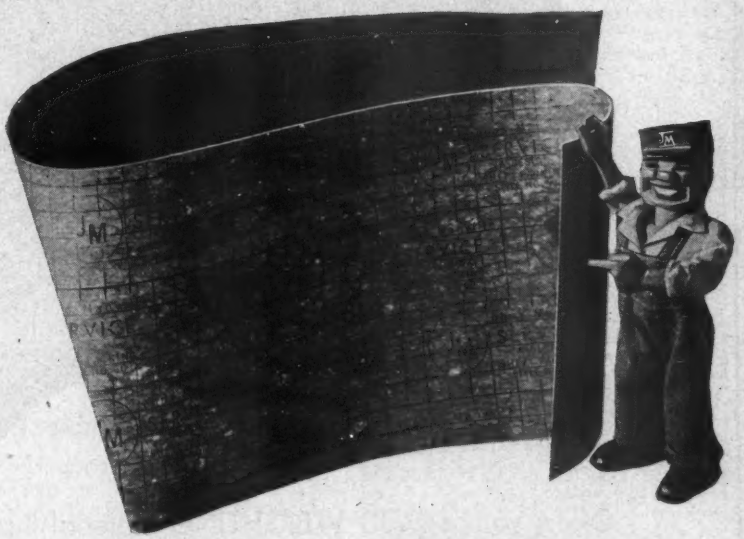
To test the tubing for possible leaks, a plug first was placed in the string at a depth opposite the packer level. With flow and pressure from the lower zone thus shut off in the tubing above the packer level, and with casing closed at the surface, it was evident from pressure built up on the tubing at the surface that flow from the upper zone was entering the tubing, indicating the existence of a leak in the string.

To locate the tubing leak an Otis extractor tool, a device ordinarily used for pulling pipe or tools from the hole, was placed directly above the packer level. Casing then was opened and the well flowed at a high rate to lower pressure in the annulus, which in turn lowered pressure in the tubing through the tubing leak. This caused the extractor tool to be pushed up to the tubing leak by flow from the lower zone. With the extractor held in this position by the tubing flow through the tubing leak, a measuring line was run to give its exact location and that of the tubing leak.

With the leak located, the extractor tool was removed and an 8-ft. length of 1-in. pipe with sealing cups at top and bottom was placed in the 2-in. tubing so that the tubing leak was positioned between the sealing cups. Otis holding devices were placed above and below the 1-in. pipe so that high rates of flow would not dislodge it. This installation provided effective separation of the two producing zones and since all of the work was done under pressure the well was then ready to be produced. Flowing pressure of tubing was 1,670 psi.

Since all operations were done with wire line, it was possible to use only a light pulling unit, thus effecting substantial savings over having to move in a rig for a tubing and packer pulling job.

It's called SERVICE SHEET



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J-M Service Sheet holds its tight, long-lasting seal against hot oil, superheated steam, air, gas, water, ammonia, many chemicals, acids, and other fluids.

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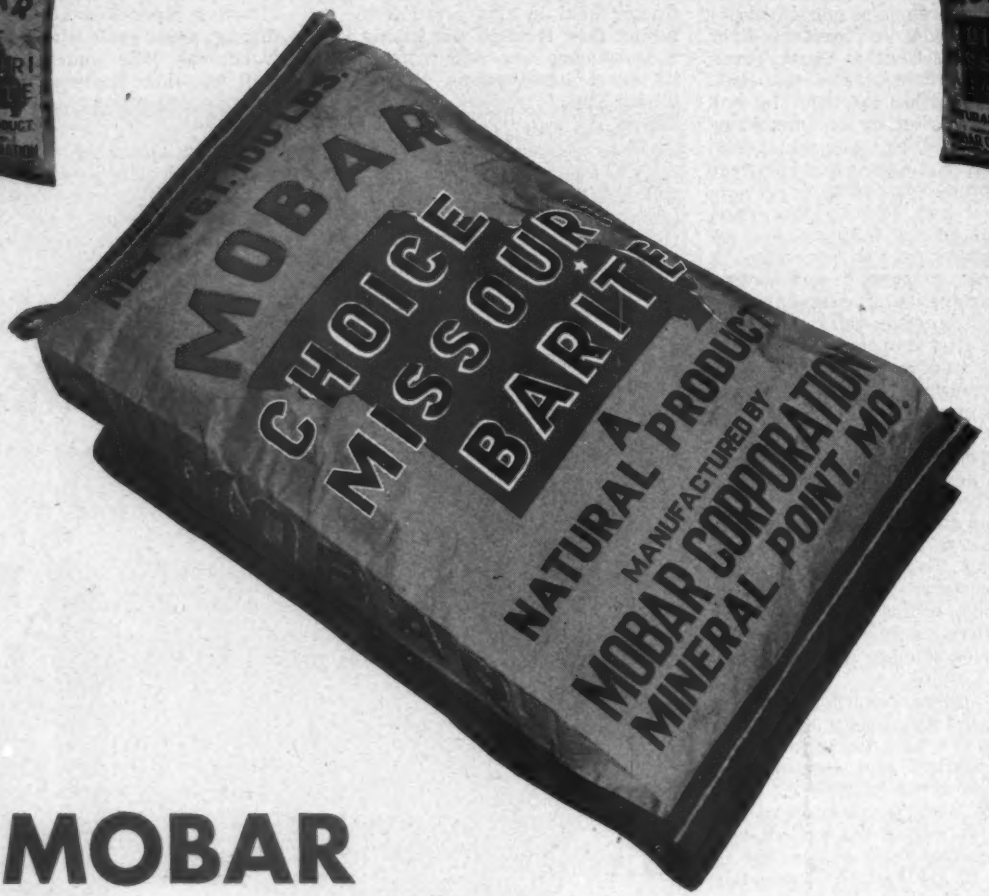

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OPERATING IDEAS

Meter House Mounted on Rollers

THIS meter house mounted on rollers is easily removed for repair or servicing of the two recording meters installed on the horizontal runs of a dual gas well in Carthage field, East Texas. Panels at the right, or downstream end, break out and the unit slides to the left from its stationary base, riding on rollers like those visible at the left end. When in place the compact insulated housing retains sufficient heat from the gas flow to maintain winter temperature of 100° F., thus preventing meter freezing. Doors at each side permit meter reading without removing shed.

Heater Stack Braced Without Guy Wires

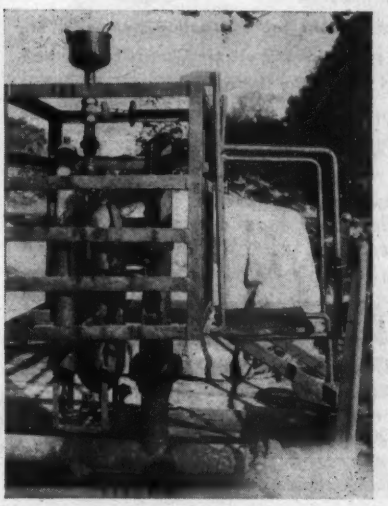
THIS rigid stack brace, mounted on a small gas well heater at Carthage does away with the need for guying the heater stack. Two short lengths of pipe, fitted with couplings are welded to stack and heater shell. The bracing member is easily connected or disconnected.

Lubricator Service Stand

TO add lubricant to the unit mounted on the main steam line from boilers to rig, one company simplifies access to the enclosed lubricator with a stand or platform which brings the fireman to the proper height to work most advantageously.

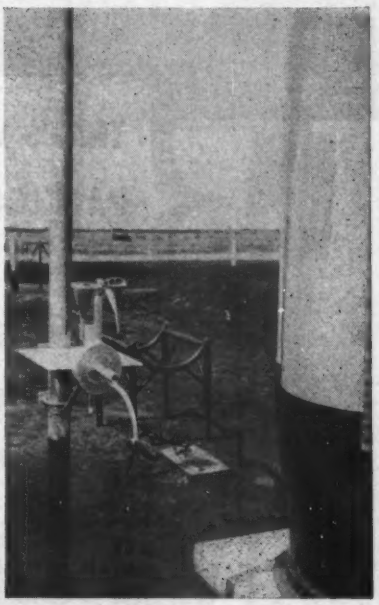
The stand is fabricated from pipe and sucker rod, with a platform of expanded metal and handrails to serve the dual purpose of stiffeners for the stand and safeguards when working in the elevated position.

The two risers which form the back of the stand are extended above the handrails, and terminate in hooks which engage the top rail of the lubricator enclosure. The base is located so as to bear against the bottom rail of the guard. A step, formed by turning down the two base rods of the stand, is braced to the stand with two diagonal strips of flat steel, with a tread of expanded metal for safety.



Shakeout Mounting

A STURDY mounting for the gager's shakeout is provided by one company on the 2½-in. flow line to the separator. The unit is mounted on a flat plate, wide enough to afford proper clearance between the revolving sample and the pipe, with halves of clamps welded to the plate and the diagonal brace which extends downward from just below the shakeout mount or clamp.



U-bolts and formed plates form the two clamps which bolt around the pipe, being set at the most convenient level for hand spinning of the operating crank.

A square cover, removed to permit the picture of the unit to be taken, fits closely over the square stand and protects the operator during the shakeout operation. The cover has a flange just above its base, so that it will fit snugly over the plate, without requiring bolts or clamps to insure its remaining in place while the samples are being centrifuged.

Tannin Solutizer Unit

(Continued from page 85)

and the coalescer which receives the caustic treated blending stock is 20 in. by 8.5 ft. In general both of the coalescers outside of the chemical section of the unit are identical in design except that the one connected to the extraction column is 6 in. larger in diameter; both are packed with glass wool. Dimensions of the extraction column are shown to be 36 in. by 35 ft.

Specifications on the regeneration column show that it is 30 in. in diameter by 27 ft. high. The vessel which serves as the blending-stock coalescer measures 30 in. by 7 ft. and the one in disulfide oil service is 36 in. by 7 ft.; both of the items are packed with steel wool. All of the settling vessels operating in connection with the coalescers are comparatively small; the fat solution settler is 54 in. in diameter by 19 ft. long.

The lean-solution tank is a commercial-type storage unit constructed of light-gage steel and rated at 250-lb. capacity. A commercial-type trap such as those employed in steam service is installed on the separator handling the effluent air from the regenerator column. All exchangers whether in cooling or heating service are tubular-type units. The filter installed in the lean-solution line to the extractor has not required servicing since initial operation of the plant in July 1946.

Operation

As explained previously the unit is operated on an average of 14 hours out of each consecutive 24-hour period. This method of operation, in essence, may be considered as equivalent to continuous operation insofar as results of processing are concerned since there is practically no "'tuning up" necessary on starting up or shutting down the unit. Preliminary operations for starting up usually require some 30 minutes or less and include wetting down the glass wool in the two coalescers and heating up the equipment. In cool weather the various units, when not operating, are heated with exhaust steam from other sections of the plant and consequently starting-up time in winter may run to slightly less than that for warm weather. Due to the comparatively moderate temperture at which operations are carried out in the unit, none of the equipment except steam lines is insulated. A study on probable heat savings resulting from insulation of the major radiating surfaces in the unit indicates insufficient economy since the refinery has at present ample low-pressure steam available to the unit for normal and warming up operations. Usually preliminary operations are begun at 8 a.m. and the unit is up to scheduled production rates soon thereafter.

Shutting down the unit requires slightly more time than that needed in its start-up operations. The major time consumer in shutdown operations is the regeneration column which must be completely drained and all moisture blown from its air diffuser tubes before the job is completed. The shutting-down operation also includes backwashing and draining the caustic and blending-stock coalescers.

Processing Results

Mercaptan sulfur in the untreated gasoline blending material processed in the solutizer ranges between 0.016 and 0.023 weight per cent. Observations on accumulated samples taken from the different transfer lines within the unit show the typical material contains, on a weight basis, 0.0168 per cent mercaptans and no disulfides, before caustic wash. After caustic wash, mercaptans were reduced to 0.0165 weight per cent and after passing through the solutizer the samples showed mercaptan sulfur in the blending stock to be 0.002 to 0.003 weight per cent. Considerable

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care was exercised in procuring and in analyzing the samples since the data obtained therefrom formed the basis of study on the process by Cities Service engineers. The particular study referred to in the foregoing is made periodically on the unit by the refinery's engineering staff as are similar studies made on all other units operating in the plant.

Improvement in octane number of the gasoline blending material from thermal cracking operations, before and after caustic wash and after solutizer treatment, is shown in Fig. 2. In the figure curve 1 is on material treated in the solutizer; curve 2 on material before solutizer or after caustic wash, and curve 3 represents material before it has been caustic washed. The various curves in Fig. 2 represent mean values on a series of tests and are plotted on a grid which conforms to that of a typical TEL blending chart.

Effects of octane-number improvement on the final gasoline indicate a savings upwards of 00.7 plus milliliter of TEL per gallon in favor of the solutizer over the previous method employed in the refinery for treating the blending material. An overall figure on octane-number improvement of the blending fraction alone on a basis of current methods versus previous methods and when expressed in TEL savings shows a gain of 0.44 ml. per gallon. Approximately one half of this savings is indicated to be derived from appreciation in current treatment and the other one-half from depreciation in the previous treatment of the fractions.

The solutizer process is licensed by Shell Development Co., New York, under its patents and those of Socony-Vacuum Oil Co., Inc.

University of Pittsburgh

(Continued from page 95)

and petroleum and natural-gas engineering to be brought in at various times during the year for special lecture work. Seminars for upper classmen, held weekly, are addressed by key men in oil and natural gas, and allied industrial fields. Regular field trips through petroleum research laboratories and the Appalachian oil and gas fields constitute a part of the undergraduate program.

At the present time, several army officers are being sent to the university for graduate work in petroleum engineering, followed by a year of training in the industry. While some graduate research is being carried out, the emphasis of the department is on thorough undergraduate training. Beta chapter of Sigma Gamma Epsilon, honorary mines fraternity, is located on the campus. In addition, the school has a chapter of Sigma Tau, honorary engineering fraternity.

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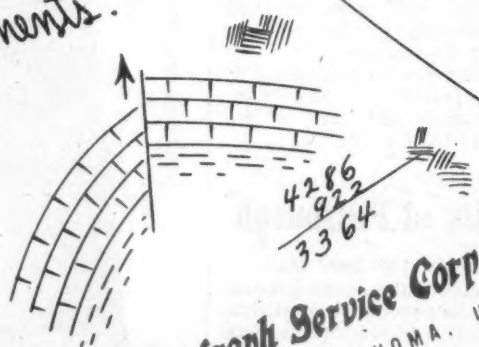

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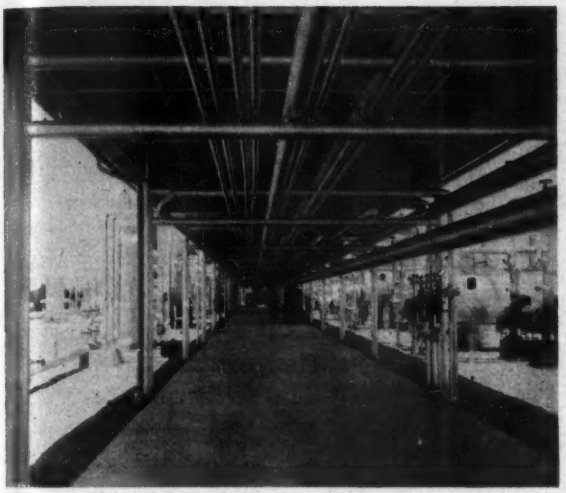
PLANT PRACTICES

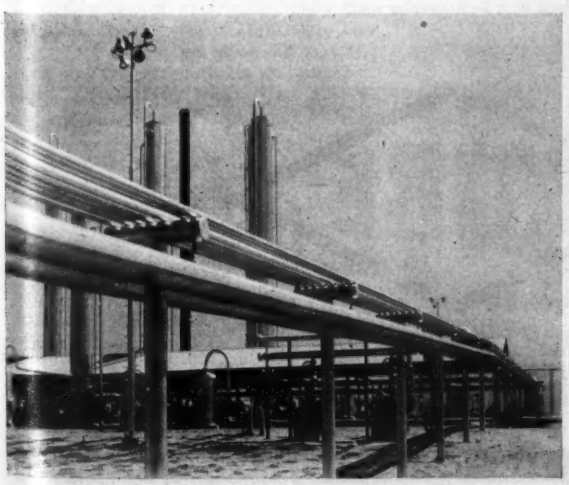


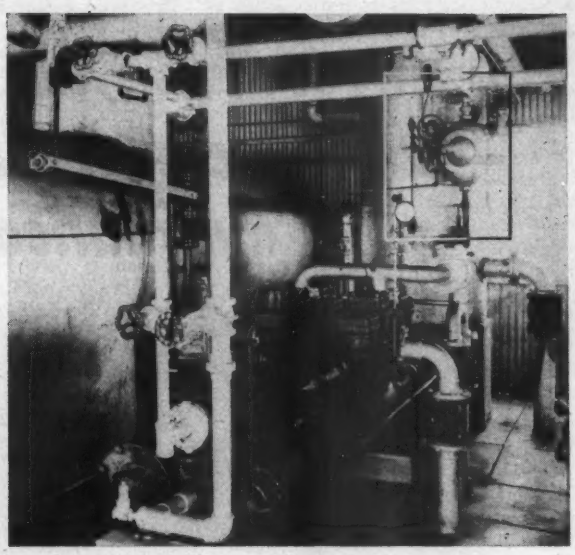
Hot Piping Protected by Sheet Metal

LINE piping in a Texas gasoline plant is covered with a protective sheet metal roof. This roof protects the line in case of rain, thus preventing heat changes caused by rain striking the pipes. In addition, the roof provides a protected walkway for employes. As shown in the picture, the roof rests on extensions to the normal pipe supports.

Steam Lines Suspended by Chains

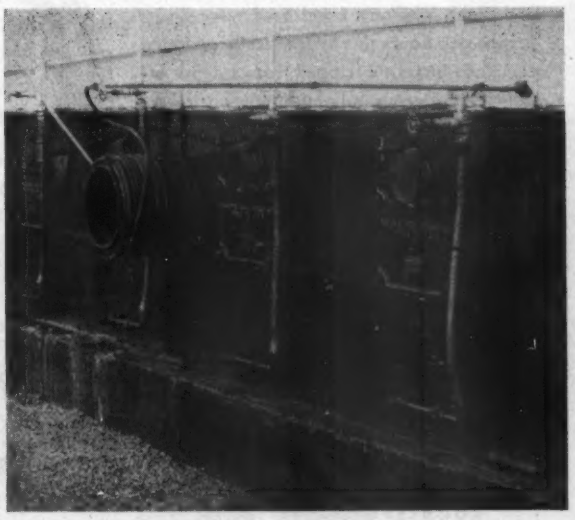
IN a Texas gasoline plant, chains are used to suspend steam lines, the chains permitting expansion and contraction of the lines. T-shaped supports are used to suspend the chains and product lines are run on the top of the supports giving them a dual function.





Low-Water-Level Alarm

AS a safety measure, one of the operators of a gasoline plant in Winkler County, West Texas, has installed a low-water-level alarm on the plant's boiler-feed-water heater. The alarm, a siren, is actuated automatically by a Mercoid switch which is located on the float arm of the heater's liquid-level controller. Position of the switch is such that the siren warns of approaching danger well before the actual danger point is reached. In normal operations the siren does not operate but in cases of failure of the air to any of the various instruments in the feed-water control system or for other reasons which may cause the controls to fail the siren is sounded when the water level falls below safe limits.



Torch for Lighting Furnaces

THE torch, shown in the photograph, is used in one refinery for lighting a battery of closely spaced burners in several of its heaters. Sufficient rubber tubing is carried on the reel to permit the torch being used on three furnaces.

You never pull this pump —*it surfaces and seats hydraulically!*

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Kobe Free Pump is an adaptation of the conventional Kobe Hydraulic Pump. "Free" refers to the fact that it is not suspended in the well at the end of rods or tubing. It is an individual unit that is raised and lowered in the well tubing, hydraulically.

Pumper turning 4-way valve to "pump out" position to surface Free Pump

Lifting 2" bottom hole Free Pump from well after surfacing.

All you do to retrieve or run the new Kobe Free Pump is to turn a wellhead valve. In less than two hours this hydraulically operated pump can be round-tripped from a depth of 5,000 feet. During only 30 minutes of that time is it necessary for the pumper to be present. In eliminating pump pulling, Free Type Pumping introduces an entirely new concept of oil well pumping. It cuts pumping operating expense by 25%, and eliminates costly downtime and lost production.

Repairing or replacing a pump need no longer involve the added expense of pulling and running. Changing pumps to meet changing well conditions can now be determined solely on the desirability of the change.

Free Pumping is the product of eight years of research and four years of field testing. It is a new application of a proven practice. It makes the maximum use of *Fluid Power* and hydraulic pumping facilities on the lease.

Start now to eliminate pump pulling from your operating budget. Call your local Kobe representative to arrange a demonstration of Free Pumping in a nearby well.

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To learn how the Kobe Free Pump can reduce your pumping costs, write for the booklet, "Free Type Pumping." It will be forwarded without obligation.

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BOOKS

SUBSURFACE GEOLOGIC CROSS-SECTION FROM SCOTT COUNTY, KANSAS, TO OTERO, COUNTY, COLORADO. Published by State Geological Survey of Kansas, Lawrence. 25 cents.

This is the fourth in a series of regional stratigraphic investigations of the subsurface Paleozoic rocks in western Kansas, eastern Colorado, and parts of the adjacent states, carried out by the U. S. Geological Survey, and published by the Kansas Survey. In addition to the cross-section there are 11 pages of text discussing the various characteristics and correlations of the formations.

REVIEW OF PETROLEUM GEOLOGY IN 1946. By F. M. Van Tuyl and W. S. Levings. Quarterly of The Colorado School of Mines, Golden. 316 pp. $2.50.

This annual review of published information is supplemented by statements from many leading workers in the oil industry regarding improvements in techniques, special investigations, developments in specific areas, and other topics. An attempt is made to predict trends in petroleum exploration and to survey authentic opinions regarding the future of the oil industry. The expansion of the report to cover the activities of state geological surveys of interest to petroleum geologists and the more complete coverage of developments in foreign countries should enhance its usefulness to the oil fraternity. In their introduction the authors admit that it has not been possible to analyze all the literature critically, and that it is probable that numerous worthwhile scientific articles and books deserving of special mention in the text are given recognition only in the classified bibliography, which in the present issue has grown to almost 3,000 entries.

Motors and Controls

(Continued from page 87)

building up excessive heat inside the case and thus prematurely setting off the thermal overload trip.

This control unit normally includes a fused line switch, a motor-starting magnetic switch, an automatic time switch, a selector switch for either manual or automatic starting and stopping, an undervoltage protective relay, temperature overload relays, and a service protector for lightning protection. The undervoltage protective relay is not desired in some localities and is therefore omitted. The same is true of lightning protection. In fields where the wells are pumped continuously, the time switch is replaced by a start-stop push button. All the other apparatus is basic, fundamental equipment for every oil-well-pumping-motor starter. This apparatus is assembled as a single control unit which is mass produced at relatively low cost. Factory wiring of the whole assembly makes installation very simple.

Time-Cycle Pumping

Time-cycle pumping is used where production is prorated, or where, due to the small productivity of a stripper well, the well is pumped only a few hours a day. An automatic time switch starts the motor. After the motor runs the preadjusted length of time, the switch automatically shuts it off, without attention from the pumper. Operating cycles may be repeated several times a day or once a day, as specific requirements dictate. The time switch may be arranged to stop the pump one or more days a week if desired. Automatic time-cycle pumping meets exact production schedules on time. There is no delay and no over-pumping. Stripper wells, equipped with automatic pumping control, last longer and give greater ultimate yields.

Slow-motion beam pumping, under 10 s.p.m., often extends the profitable productive life of a stripper well. Slow-motion pumping has often produced the same, or an even greater, volume of oil at a reduced operating cost. Available records show that diminished pumping speed has lowered the per-barrel cost of oil by reducing power consumption and maintenance expense without sacrifice of production volume. To obtain a slow pumping speed without using expensive slow-speed motors, add more gear or sprocket-and-chain reduction between the crank shaft and the motor shaft.

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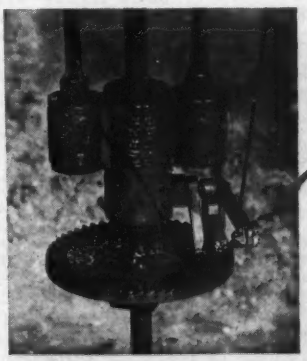
PARAFFIN SCRAPERS

Imagine what you could save by eliminating the frequent and costly job of steaming out or "passing rods" to free your well of paraffin.

Huber Scrapers make a paraffin scraper out of your sucker rod string. These steel blades, shrink-welded to the rods, scrape the paraffin from the tubing as the string rotates and reciprocates. With the string rotated a fraction of a turn on each stroke, the scrapers keep the tubing wall free of any paraffin.

Operation of the Huber Scrapers is automatic and entirely mechanical. They require no service or attention. Install Huber Scrapers in your paraffin wells and eliminate the cost of paraffin removal.



AUTOMATIC ROD ROTATION

This rotating rod hanger is attached to the unit's or jack's head by conventional wire line bridle. Two ratchet levers engage the turntable, and by means of a flexible steel cable from the ratchet arm to the walking beam, the rods are rotated a fraction of a turn with every stroke of the pump.

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50 YEARS . . . The galvanized metal roof on this old Missouri farm building has outlasted the building itself, and is still in good condition after half a century of service. Industry and the farm have long depended on galvanizing to protect iron and steel against costly rust. Builders know that as long as iron or steel is zinc covered, it *cannot rust.*

In building for the future, look to the past for proof of a building material's strength . . . durability . . . service. With *galvanized* (zinc-coated) roofing and siding you get the strength of steel . . . the rust protection of Zinc. So for low-cost, long-time service choose the building material that's proved by TIME itself . . . galvanized sheets. Send coupon for information about Zinc and how it helps keep buildings and equipment *stronger longer.*

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Marvel Mystery Oil is specifically compounded to resist heat. Here's liquid armor for your engine's heart—this *extra*-tough protective film cleans as it clads! Marvel dissolves sticky gum, sludge and varnish from valves, guides and rings—keeps them cleanly coated.

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PROGRESS IN METALS

by W. L. Nelson

Consulting Engineer

Inspection for Cracks

CRACK inspection has progressed considerably in the past 20 years. In the early days such detection did not depend so much on the eye as the ear. Today the "eyes have it." In the early days defects were supposedly discovered by vibrating or ringing tests. Thus, parts were threaded onto a rope or pole and while hanging were struck with a soft metal rod. In the case of a sound part, the note would be clear and bell-like. However, the method would not discover minute cracks, and in complicated designs would give an entirely incorrect result.

One of the older methods that still has much to commend it is the bouncing test. Components are dropped from a certain height upon a hardened steel plate and on the rebound should reach a certain predetermined height.

The acid-etch method is extremely useful especially on nonferrous alloys and stainless steels. Faults that can be discovered are inclusions (metallic and otherwise), cracks, porosity, and mechanical defects; also for calculating the depth of carburizing and nitriding. Etching will also reveal the direction of grain and the crystal structure.

Chalk tests have a fine record of detection under certain conditions. Components are immersed in a bath containing paraffin plus a small amount of thin oil which is kept at 160° F (70° C.), and allowed to soak for 30 minutes. They are partly dried, the oil is wiped off, and they are dusted evenly with french chalk. Oil still remaining in the defects is pulled to the surface by the chalk, these defects showing as wet lines or blotches.

Probably the most widely used is the electromagnetic method which can be used for magnetic steels; there are two types of such machines: Magnaflux and Electroflux. The former machine is a powerful electromagnet, the poles of which hold the component being examined.

When in operation the flux flows from one pole to the other, passing through the component. Any discontinuities at right angles to the flux flow will form two poles and attract the small iron particles that are suspended in the liquid (largely paraffin oil containing a suspension of fine, powdered iron particles) which is poured over the work piece when the current is flowing.

In the second electromagnetic method the current is passed through the component and a circumferential field is formed around the part. Here the defects must be longitudinal and this type is for defects of this nature. A recent innovation is the fluorescent flaw detector, components being first soaked in a fluorescent solution, then washed in a blanking off solution. The component is then placed under an ultraviolet lamp which fluoresces the defects, the rest remaining dull.

One of the latest methods is supersonic, which has located defects 0.020 in. long at a depth of 40 ft. However, it gives no indication of the size or severity of the defect.

Abstract of "Crack Inspection" by F. W Giles, Engineering Inspection Vol. 10, Winter 1945, p. 22, taken from Materials and Methods, August 1946.

Welding Steel Pressure Vessels

THE average welded pressure vessel is fabricated using simple welded butt joints for main seams. These provide for a uniform or smoothly graduated path for stress flow with very few design problems.

It is seldom necessary for a pressure-vessel fabricator to go into as complete detail for a welding procedure as may be necessary for a new structural weldment. This is particularly true for thin, mild-steel vessels in which the welds are simple butt joints and where these have some degree of elastic behavior. The welding stresses in thin vessels, however, become a problem insofar as dimensions and tolerances are concerned.

Jigs and fixtures often are satisfactory means for preventing distortion during welding. Welding sequence will also do a lot to control distortion. One interesting method for the accomplishment of this is the use of a double "U" or "V" groove and the simultaneous deposition of root passes.

In heavy plate welds, the additional thicknesses result in a more drastic quench of the molten weld metal, increasing the stress problem, and also results in no yielding to the volumetric shrinkage of the deposited weld metal. In controlling stress failures, consideration must be given to the geometry of the weld so as to minimize stress concentration; the proper energy input during the weld as controlled by the size of electrode, number of passes, and rate of deposition; the use of cascade procedures when necessary; sequence of welding to avoid shrinkage stresses; the use of proper preheats; interpass temperatures and post heats to control properly the quenching effect and the resultant hardening in the heat-affected zone.

It is important to a pressure-vessel fabricator that considerations as to plate quality be kept constantly in mind. Experience indicates that most rimmed steels which are over ⅜ in. thick will give serious trouble when welded by high-energy-input method.

Where U-68 construction is to be used and where high-energy welding methods are considered, the better grades of steel more than save their extra cost. When vessels are built which are to operate at reasonably high working pressures and temperatures, every possible inspection tool should be employed to determine the soundness as to plate quality.

Abstract of "Fabrication of Welded Steel Pressure Vessels," by O. R. Carpenter, Industry and Welding, Vol. 19, Feb. 1946, p. 44, taken from Materials and Methods, May 1946.

Fine Sucker Rods

THE combination of direct stress, repeated loading (fatigue), and abrasive wear, to which sucker rods are normally subjected is obviously severe, but add to this the corrosive action of hydrogen sulfide and salt brines, and a truly difficult situation arises. This appears to have been met most successfully by the use of nickel-molybdenum steels. One type of alloy is a modified S.A.E. 4620 analysis used for severe corrosion by sulfide and brine and it exhibits a high yield point, ductility, impact resistance, and fatigue strength. An S.A.E. 4620 steel contains about 0.2 per cent carbon, 1.65-2.00 per cent nickel and, 0.2-0.3 per cent molybdenum. For more severe conditions a modified S.A.E. 4815 analysis (3.5 per cent nickel) is employed.

Although corrosion fatigue is a long-recognized phenomenon, extensive experimental data are not yet available. Engineers of Axelson Manufacturing Co., of St. Louis, are conducting a detailed program for the development of a standardized corrosion-fatigue testing procedure.

In attaining the very best combination of physical properties, the manufacturing procedure followed is somewhat as follows:

1. Selected hot rolled bar stock is straightened.

2. Ends are upset so that the forging is concentric with the bar and all grain flow lines follow the direction of stress that will be applied when in use.

3. The forged rods are normalized at 1,600° F. and tempered at 1,000°-1,225° F.

4. Shot blasted to clean and cold work the surface of the rod from end to end.

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The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Lime-Soda Softener Control

THE amount of soda ash (sodium carbonate) and lime required to treat boiler feed water is determined by means of titration with sulfuric acid and it is sometimes useful to determine total hardness by means of a soap test.

Solutions

Sulfuric acid — N/20. Requires 2.4519 g. pure acid per liter of water. Best to standardize against sodium carbonate.

Phenolphthalein indicator.—5 g. crystals per liter denatured alcohol.

Methyl orange indicator. — 1 g. per liter distilled water.

Soap.—Dissolve 10 g. pure castile soap in 1 l. dilute alcohol (2 parts absolute alcohol to 1 part water) and filter off insoluble material. A standardizing solution is prepared by dissolving exactly 1 g. pure calcium carbonate in the least possible amount of hydrochloric acid, making just neutral with ammonia and diluting to 1 l. with water. One milliliter of such a solution contains the calcium salt equivalent of 1 mg. of calcium carbonate. In standardizing the soap solution, measure 10 ml. of the standard calcium solution into a 250-ml. glass-stoppered bottle and add 90 ml. of distilled water. Add soap solution in 0.5-ml. increments, shaking after each addition until a suds persists for 5 minutes. The standardization should then be repeated but making the final additions of soap solution in 0.1-ml. increments. Finally, rinse the bottle and repeat using only 100 ml. of distilled water. The milliliters of soap solution required for the pure water should be subtracted from the quantity required when using

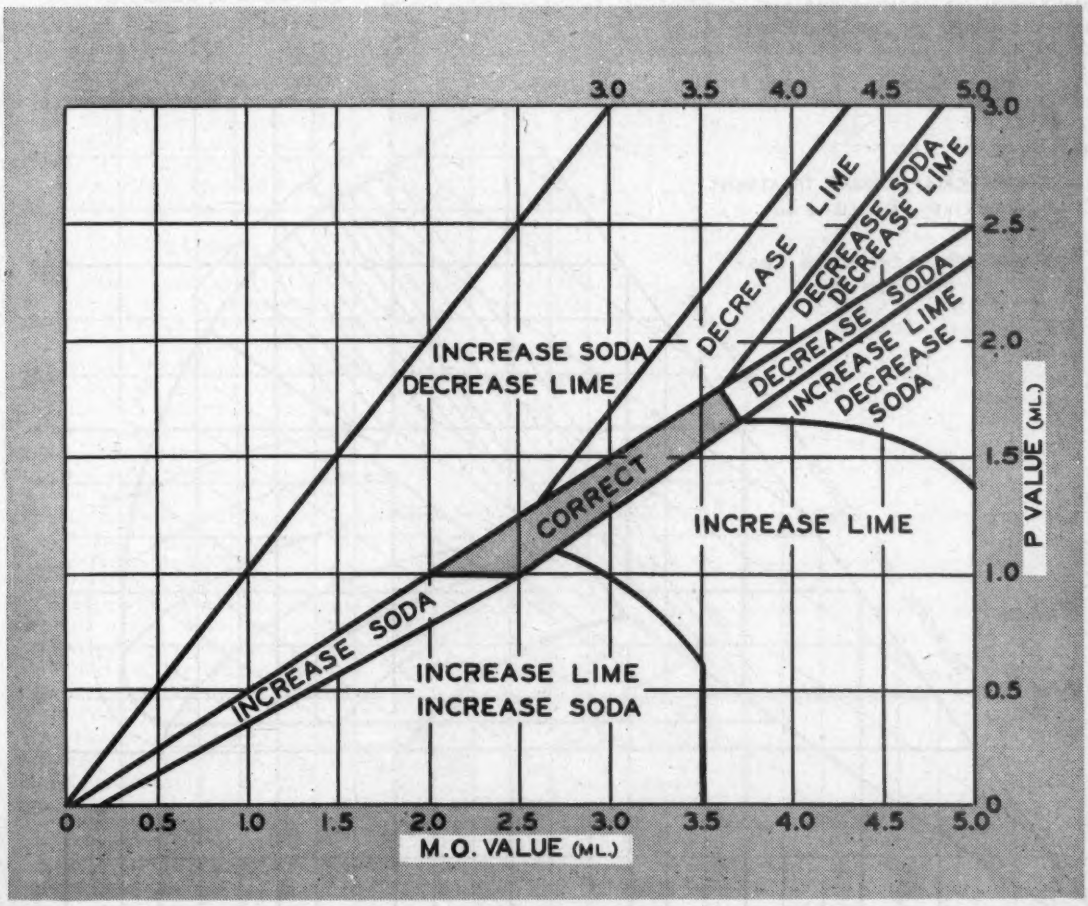


Fig. 1—Quantitative chart for determining amount of soda and lime for correct boiler water treatment. (Courtesy Cochrane Corp.)

No. 161 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

the calcium solution. A factor is computed denoting the calcium equivalent of the soap solution and the date of standardization is recorded because the soap solution is not stable particularly during cold weather.

Alkalinity Procedure

Remove any sediment from the treater effluent by filtering. Titrate 100 ml. of the water in a porcelain dish with N/20 acid using 2 drops of phenolphthalein indicator. Record the milliliters of acid required to destroy the pink color, as the P value. Add 2 drops of methyl orange indicator and continue the titration with acid until an orange tint is obtained. The total amount of acid (ml.) is recorded as the M.O. value.

Hardness Procedure

Determine the amount of soap solution required to produce suds in 100 ml. of the treater effluent by following the procedure outlined for standardizing the soap solution. The amount of soap solution required multiplied by its standardization constant and multiplied by 10 is the total hardness of the water expressed as parts per million of calcium carbonate or its equivalent.

Adjustment of Chemicals

Suitable relationships of the P (phenolphthalein) and M.O. (methyl orange) values of a treated water are indicated in the approximate centers of Figs. 1 and 2. The qualitative chart (Fig. 1 on preceding page) may be used to judge whether or not the amounts of lime and of soda being used should be increased or decreased. Having determined whether increases or decreases in the amount of chemicals are required, the approximate changes in the quantity of chemical (pounds per thousand gallons) can be estimated from the quantitative chart (Fig. 2).

Suitable treatment is attained when the P and M.O. values fall within the correct treatment areas of Figs. 1 or 2 but, of course, less chemical is required at the lower ranges of suitable values of P and M.O. The ranges of suitable treatment are somewhat as follows:

M.O.*	P
2.4	1.1
2.7	1.2
3.0	1.4
3.4	1.6

Note that (M.O. — 2P) is about equal to 0.2 ml.

Example.—If upon titration with acid, the circle points shown on Fig. 2 are obtained, the changes in the amounts of chemicals should be as follows:

P	M.O.	Change soda, lb. per 1,000 gal.	Change lime, lb. per 1,000 gal.
1.0	3.4	Decrease 0.1	Increase 0.3
1.8	3.8	Decrease 0.8	None
2.4	3.7	None	Decrease 0.24
2.1	3.0	Increase 0.45	Decrease 0.25

The use of excess soda ash can also be checked by subtracting the total hardness obtained by the soap test (but multiplying by 0.0583 to convert p.p.m. into grains per gallon) from two times the difference in the M.O. and P values, thus:

$$2\,(\text{M.O.} - \text{P}) - 0.0583\text{H}$$

The result so obtained is the grains per gallon of excess soda ash alkalinity.

Conversion of Units:

Grains/gal. × 17.15 = p.p.m.

P.p.m. × 0.0583 = grains/gal.

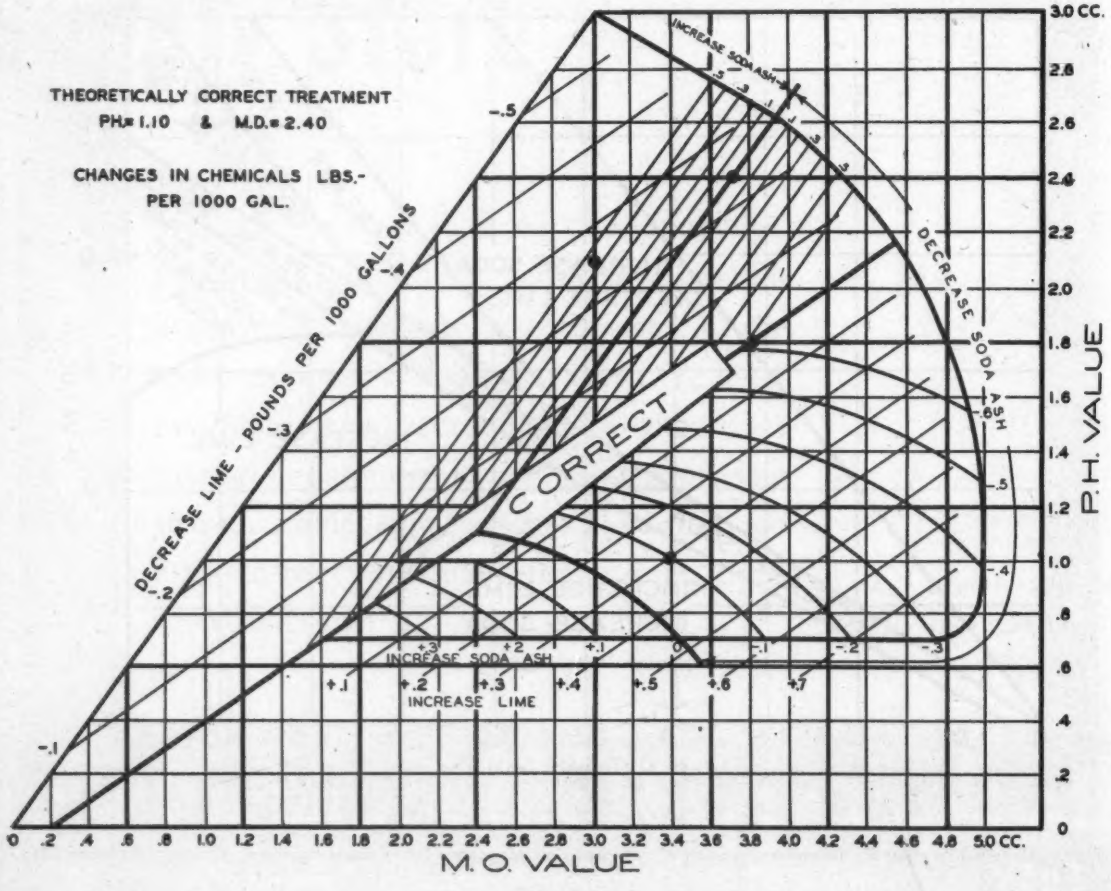

THEORETICALLY CORRECT TREATMENT
PH= 1.10 & M.O.= 2.40
CHANGES IN CHEMICALS LBS.-PER 1000 GAL.
DECREASE LIME - POUNDS PER 1000 GALLONS
INCREASE SODA ASH
DECREASE SODA ASH
CORRECT
INCREASE SODA ASH
INCREASE LIME
P.H. VALUE
M.O. VALUE
3.0 CC.
0 .2 .4 .6 .8 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 CC.

Fig. 2

MODERN Rotary DRILLING

Flexibility of Steam Engines Well Suited to Drilling

CHARACTERISTICS of a steam engine which makes it ideal for rotary-rig service, have been referred to previously in this series (Installments 14 and 35). They include development of peak torque at the point of stalling, wide range of speed variation, and simplicity of construction.

Development of steam engines to adapt them to conditions of modern drilling was along two general lines. First, new larger sizes of engines have been developed. Second, improvements have been made in materials used, in details of manufacture and construction, and in types of lubricating systems employed.

Drilling Engines

On heavy-duty rotary drilling rigs a 14 by 14, twin-cylinder horizontal steam engine is now being used. Fig. 35 shows the torque and horsepower characteristics of one such engine. It is designed for 400 psi. maximum steam pressure, it has the maximum recommended crankshaft speed of 400 r.p.m. for intermittent service and of 250 r.p.m. for continuous service. At 400 r.p.m. and at 400 lb. manifold pressure the engine develops 1,690 hp. The engine is characterized by an extremely rigid frame, heavy-duty tapered roller bearings, use of special steels in different component parts of the engine, and design assuring ease of accessibility for servicing.

A 15 by 16 horizontal, twin-cylinder steam engine is now available, capable of efficiently powering ultradeep drilling operations and offering unusually high reserve power for present normal deep-drilling operations. Only a few of these engines are so far in actual use.

Auxiliary Engines

Many of the heavy-duty drilling rigs employ small steam engines for auxiliary service, reserving the large drilling engine primarily for hoisting operations. These auxiliary services include independent coring reel drives, independent rotary drives, and hoisting standby service. In independent coring reel drives small horizontal steam engines are used. Or, the reel is driven by a vertical steam engine, through a chain or V-belt drive. These vertical steam engines, which require a minimum of floor space and are highly efficient, are used also for independent rotary drives.

Some of the barge rigs use an auxiliary 12 by 12 horizontal, twin-cylinder, auxiliary steam engine, set behind the draw works. Through suitable clutch arrangement the engine may be used for driving of coring reel, for rotary drive through draw works, and as a hoisting standby unit.

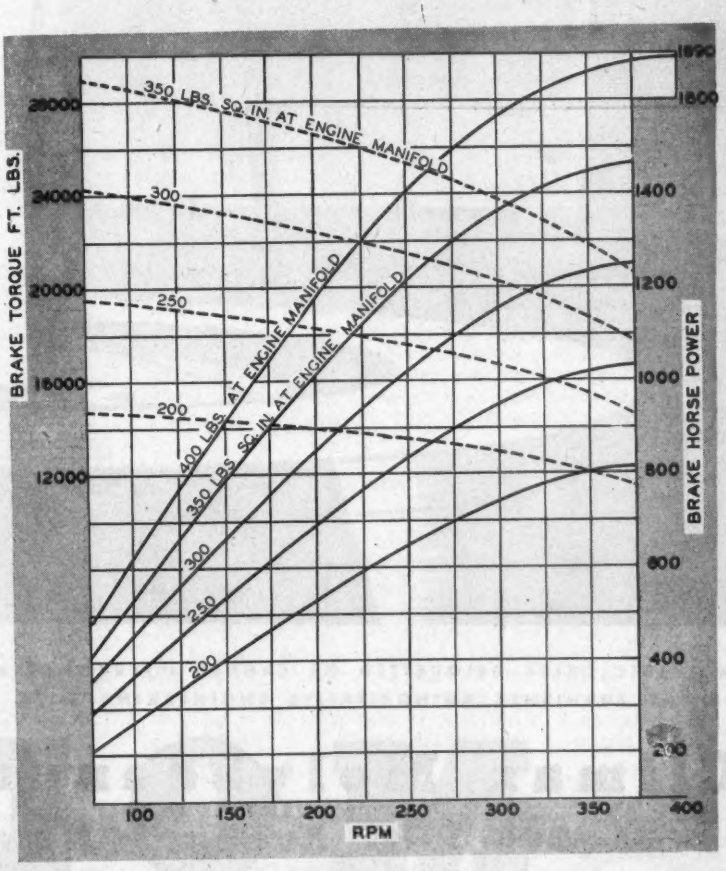
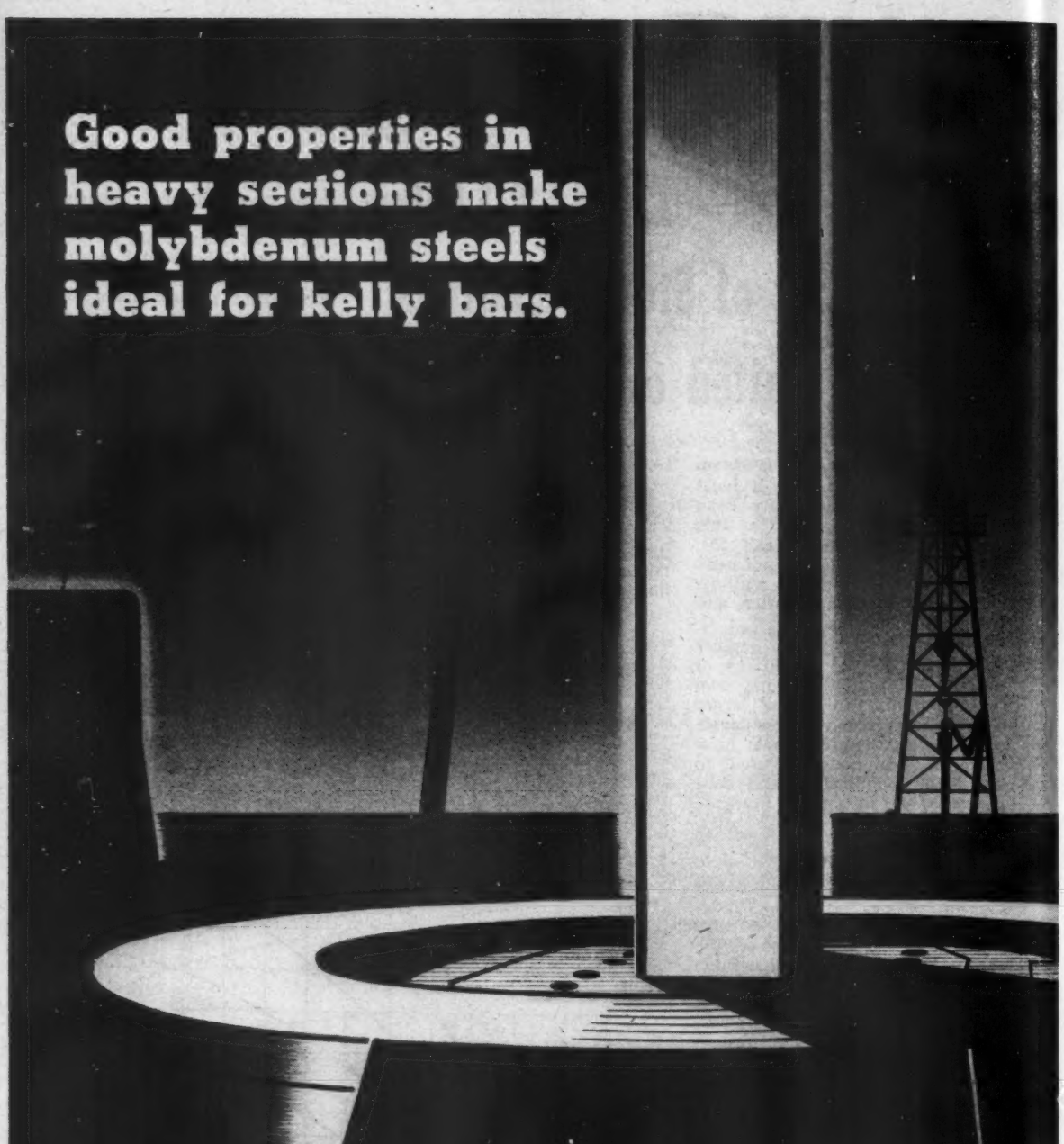


Fig. 35—Horsepower and torque curves for a 14-by-14, twin-cylinder, horizontal, steam drilling engine

No. 37 in a series by Joseph Zaba, petroleum engineer, Houston



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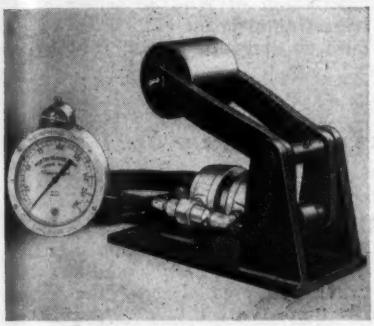
IT'S NEW CHECK IT

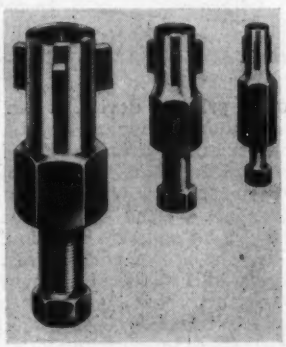
by John M. Spears

(1) HYDRO-MECH TORQUE GAGE assembly consists of a pressure-unit gage for installation at the driller's position and connecting high-pressure flexible hose. A lever arm carries a steel idler wheel supported by an "O" ring-packed piston and cylinder from the chain idler assembly. Chain idler assembly is installed under the tight side of the rotary chain, where by pumping more or less fluid into the cylinder, the idler roller is raised or lowered to deflect the chain. The tendency for chain to straighten under load exerts force against roller which is supported through the lever by the fluid in cylinder. Pressure developed within cylinder varies according to force exerted on roller by deflected chain. Pressure variations are transmitted through the high-pressure hose to the gage located in the drilling control panel at the driller's station. *Martin-Decker Corp.*



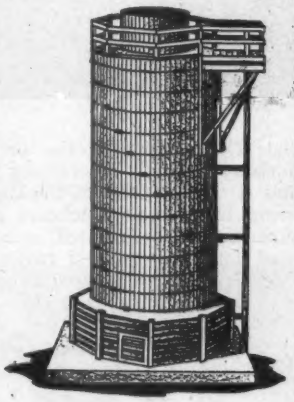
IT'S NEW CHECK IT

(2) INTERNAL PIPE WRENCH has sufficient strength to strip a thread without losing its grip. Tool quickly and easily removes broken pipe, close nipples, and gate and globe valve seats. It consists of a screw-type mandrel that forces outward three gripping dogs until they bite firmly into inside of pipe. Then, with the application of any standard wrench, the pipe or nipple is quickly turned loose and removed. It may be used on nickel, chrome, or brass fittings. The gripping dogs are made of hardened tool steel and body is high tensile steel alloy. Available in eight sizes ranging from ½ to 6-in. *Porst Sales.*



IT'S NEW CHECK IT

(3) NEW CYLINDRICAL TOWER eliminates dead air spaces which occur in present-day rectangular and octogan-shaped towers. Principle of cylindrical design prevents dead air from accumulating in corners which impairs the efficiency of the tower. Circular design allows air to enter the tower from any point of the entire 360° circumference, instead of from only two sides — or two sides and four corners. This factor accounts for a more even distribution of air, and also reduces the need for baffles or diverters. Round construction of the tower allows loads imposed by wind to be reduced; in turn, reduces loads imposed on supporting structures, such as buildings, substructures, or concrete foundations. Tower may be built in either individual or multiple-cell units—either of wood or steel construction. *Santa Fe Tank & Tower Co.*



IT'S NEW CHECK IT

(4) REFLECTOGAGE utilizes supersonics for thickness measurement and flaw detection. With the new instrument thickness of metals and other materials can be measured where access from only one side is available. Maximum error in measurment is less than 2 per cent of the thickness of material. Thickness of tubing and flat parts, between .005 and .300 in., can be read directly from the face of the oscilloscope screen. Indirect reading of the thickness of parts up to 4 in. can be accomplished with slight calculation. A quartz-crystal

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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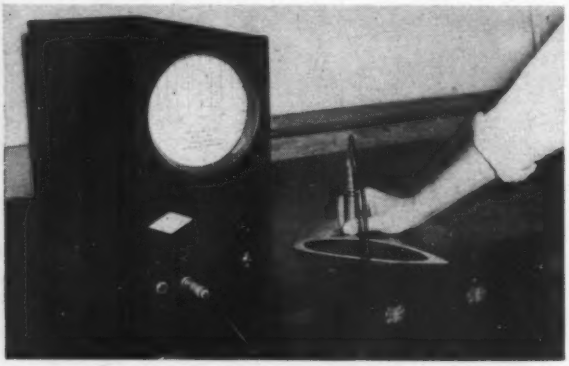
searching unit is applied to the oiled surface of the material and oscilloscope pattern observed by the operator. A vertical deflection of the oscilloscope trace will indicate resonance of the sound beam within the material. The position of the vertical deflection along the horizontal axis is determined by the resonant frequency and is thus related to thickness. When thin pieces are being tested, this thickness is read directly from the superimposed calibrated screen. A different screen is used for each type of material and for each of four thickness ranges. *Sperry Products, Inc.*



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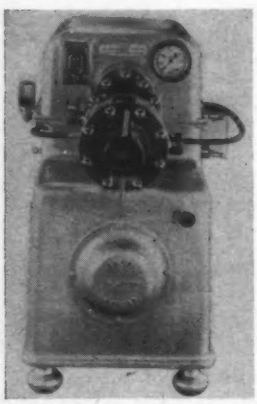
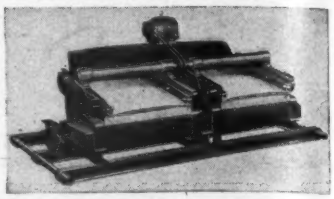
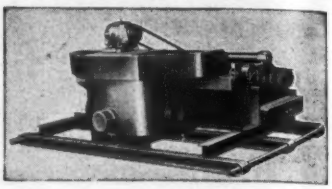


(5) CONTINUOUS GREASE PROCESS eliminates batch processing and produces a homogeneous, uniform product. Base ingredient is conducted from an autoclave into subsequent processing units. Additional liquid base ingredients are proportioned into the mixture by pumps in any quantity desired. All ingredients are then mixed in a Roto-Feed continuous mixer. At this point dry additives may be added by a dry proportioner and water or other liquid additives proportioned into mixture by another pump. Heart of the mix process is the temperer (illustrated) which thoroughly processes all ingredients under temperature control. Temperer blends, mills, and homogenizes all ingredients and passes them along to packaging units without need of additional pumps. *Marco Co., Inc.*

IT'S NEW CHECK IT

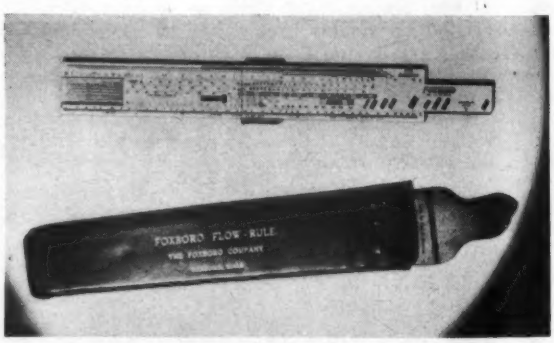
(6) NEW DUAL MUD SCREEN is completely unitized, readily transportable, for reconditioning drilling mud on shallow, medium, or deep oil-well drilling work. Complete self-contained unit includes two 36-in. wide by 48-in. long vibrating screens driven individually by V-belts from a single electric motor, steam turbine, gas, or diesel engine; a builtin mud-receiving box; a screened-mud collecting outlet or trough connection on either or both sides of unit; and rugged conveniently handled steel skids on which everything is compactly mounted. The integral mud-receiving box is provided with threaded pipe connections for mud—inlet pipe and bypass pipes. Separate mud-feeding weirs insure accurate division of mud between screens—and low velocity, uniform distribution of mud to screen cloth. Rigid connection of vibrating mechanism direct to screen box guarantees uniform and positive vibration of screen deck. *Link-Belt Co.*





IT'S NEW CHECK IT

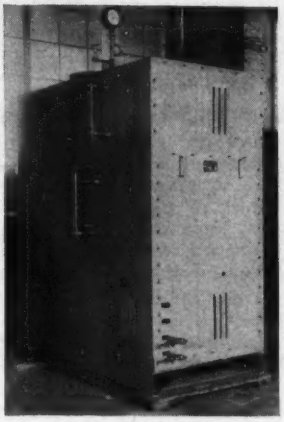
(7) NEW FLOW-RULE simplifies flow rate and primary device calculations. The 12-in. slide computes orifice plate fores, flow nozzles or venturi throats, and also the rate of flow, or the differential created across the orifice plate (whether flange tapped or full-flow tapped) or other primary device. It can be used for all fluids, with or without seals, and covers a wide range of flows and line sizes. Its average error is well within the accuracy of flow test data. Use of rule is quickly understood by anyone familiar with a slide rule. All necessary instructions are on the back. The reversible slide has scales for gas on one side and liquids and steam on the other side. The use of color to distinguish the scales for such fluids adds to the instrument's convenience. Other color bands are shown with tick marks indicating the i.d. of Schedule 30, 40, 80, and 120 pipe. *Foxboro Co.*



IT'S NEW CHECK IT

(8) EXHAUST WASTE HEAT BOILER functions automatically on exhaust gases from a turbocharged diesel engine, or it can be operated by household-type oil burner. Unit generates 500 lb. of steam per hour on the diesel exhaust and considerably in excess of that figure when operating on the oil burner. Exhaust gases of 600° to 800° F. coming from a diesel engine run the unit as

long as the engine functions. When engine is shut down, oil burner is cut in by a few simple steps, so that there is almost no interruption in the boiler's operation, and no break at all in the heating service. When no heat is required, the boiler can be run dry, acting as a muffler to the diesel engine. When the engine is operating, oil burner in boiler cannot be turned on accidently. *American Locomotive Co.*



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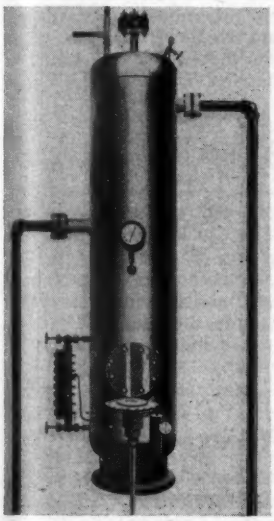
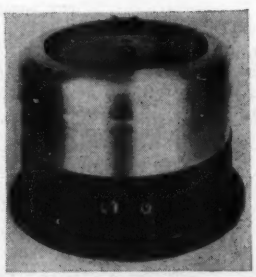


(9) NEW SMALL SEPARATOR, a 20-in. 1,000-lb. model, is scaled down to provide an inexpensive unit which will meet the gas-handling-capacity requirements of many wells or leases. Oil valve, a pilot-controlled type, incorporates a double-acting diaphragm without springs. It is a 1-in. single-seated snap-acting type which is either tightly closed, or fully open, to minimize the plug-and-seat erosion commonly caused by wire drawing. Master pilot which controls the oil valve requires very little float force for its operation. *Black, Sivalls & Bryson, Inc.*

IT'S NEW CHECK IT

(10) NEW CENTRIFUGE MACHINE for the oil gager has a builtin rheostat and switch which are countersunk in the base to prevent breakage and to aid operation. It will operate from 0 to 2,150 r.p.m. by rheostat control; required speed by A. S. T. M. specifications is 1,700 r.p.m. Due to low amperage (6 volt, 7 amp.) it will not cause excessive drain on automobile storage battery. Head is numbered to identify samples in tubes. Aluminum castings and sheet metal make it durable and light in weight. Head shaft is mounted in two ball bearings and is attached to motor shaft by a clutch. *W. L. Walker Co.*



IT'S NEW CHECK IT

(11) HEXTEEL SURFACE ARMOR can be easily and quickly applied to reinforce inside of fractionating towers, soaking chambers, other refinery and processing equipment, prepartory to application of ganister lining. Prefabricated at factory in formed bars, rectangular in cross sections, with perforations and locking fingers for assembly in small enough units to enter through manholes. May be bar, angle, spot, or bolt welded to vessel wall. Mat so formed is sufficiently flexible to apply to curved surfaces. Methods developed make possible use of lining ¾-in. or 1½-in. depth. Hextell can be made of a variety of metals for particular applications. *Wm. F. Klemp Co.*

IT'S NEW CHECK IT

(12) SARAN-LINED STEEL PIPE conveys corrosive chemicals, oils, and solvents by combining the rigidity and pressure strength of steel pipe with Saran's resistance to corrosive liquids. Working temperature, of pipe ranges from 0° to 190° F. depending upon service conditions. Conventional power tools may be used for cutting and threading, and assembly of joints is very similar to that of standard steel piping. Pipe sizes are from 1 to 4 in. with maximum length of 10 ft. Fittings include elbows and tees, companion flanges, and gaskets. *Dow Chemical Co.*

IT'S NEW CHECK IT

TRADE LITERATURE

(13) HORIZONTAL HEATERS. New 16-page, 2-color booklet treats manufacturer's emmersion-type horizontal heaters. Descriptive illustration shows travel of oil and action of the heat. Dimensional drawings, operating in-

structions, and capacity charts included. *Parkersburg Rig & Reel Co.*

IT'S NEW ✓ CHECK IT

(14) STOCK GEARS AND SPROCKETS. A comprehensive listing of stock gear products is presented in alphabetized 128-page pocket handbook. Illustrations and price list included. Last seven pages are devoted to engineering data related to gears. *American Stock Gear Co.*

IT'S NEW ✓ CHECK IT

(15) HYDROCARBONS. New 1947 booklet supplement describes new hydrocarbon products which are now offered by manufacturer. Contents include research-grade hydrocarbons; pure grade, technical grade, and commercial-grade hydrocarbons; special-purpose hydrocarbons; and application of products to A.S.T.M. tests. *Phillips Petroleum Co.*

IT'S NEW ✓ CHECK IT

(16) PNEUMATIC TRANSMISSION OF INSTRUMENT READINGS over long distance is covered in 12-page technical bulletin. Topics include New-Matic transmission, testing speeds of pneumatic transmission, and summary of recommendation. Illustrated with charts and graphs. *Brown Instrument Co.*

IT'S NEW ✓ CHECK IT

(17) LOW-AIR-PRESSURE OIL BURNER. Bulletin covers type LAP oil burner, using low-pressure air for atomization, for firing process burners of all types, with light or heavy fuel oil, under manual or automatic control. Descriptive material also includes single-stage centrifugal blower. Capacity tables, piping, and air-flow data presented. *National Airoil Burner Co., Inc.*

IT'S NEW ✓ CHECK IT

(18) WATER ANALYSIS. New 100-page booklet makes available, in a concise form, the methods of analysis of water adopted for use in company laboratories. Methods presented have been found suitable for rapid work without undue sacrifice in accuracy. Most of them are based on long experience, while others embody recent developments as described in literature. *Solvay Process Co.*

IT'S NEW ✓ CHECK IT

(19) HORTONSPHEROID AND HEMISPHEROID. New 16-page booklet describes the reduction of evaporation losses from motor and natural gasolines by storing them in Hortonspheroids and Hemispheroids. A standard capacity table indicates the operating pressures available for each size of vessel. Cutaway drawings show the general design of the two tanks. *Chicago Bridge & Iron Co.*

IT'S NEW ✓ CHECK IT

(20) PROTECTIVE COATING AND LINING. New brochure on protective coating and lining for steel and other metals describes a wide range of Lithcote applications, plant and field facilities, research, and actual names of users. Report of actual laboratory tests are also included. These show the results of suspending Lithcoted strips of mild steel at room temperature in various solutions, such as inorganic and organic acids and compounds. *Lithgow Corp.*

IT'S NEW ✓ CHECK IT

(21) ENGINEERING PROPERTIES AND APPLICATIONS OF NI-RESIST. Revised 36-page, well-illustrated booklet gives detailed information on the physical and mechanical properties of widely used cast-nickel alloy. Performance under a variety of industrial conditions involving corrosion, heat, and wear is described. Corrosion data for 400 corrosive media are presented in tabular form. Completely indexed. *International Nickel Co.*

IT'S NEW ✓ CHECK IT

(22) TRUCLOADER. Under the intriguing title, "14 of the 101 Ways to Cash in on the Clark Truckloader," new booklet describes the versatility of 1,000-lb. fork-lift truck for handling a wide variety of lift-haul chores. Illustrated by action photographs showing the Truckloader at work in several plants, booklet presents 14 tabloid descriptions of the assignments, as suggestion that many other essential routine tasks can be easily performed at low cost. *Clark Equipment Co.*

IT'S NEW ✓ CHECK IT

(23) WIRE ROPE AND CHAIN FITTINGS. Catalog data book contains engineering information and description of complete line of wire rope and chain fittings. In addition to presenting detailed working characteristics of each product to remove guesswork in selecting the proper fitting, tables and charts make catalog a valuable reference book. *Thomas Laughlin Co.*

IT'S NEW ✓ CHECK IT

(24) PUMPS. New four-page pictorial folder illustrates 18 different series and models of pumps for every application. Essential descriptive material accompanies each illustration. *Marine Products Co.*

IT'S NEW ✓ CHECK IT

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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REFINING

Three British American Plants Being Expanded

BRITISH AMERICAN OIL CO., LTD., is making extensive alterations and additions to lubricating-oil and asphalt facilities at three of its Canadian refineries.

Additions to existing asphalt equipment are being made at the company's Moose Jaw, Sask., and Calgary, Alta., refineries, while construction of a new lubricating-oil compounding and blending plant is under way at the Clarkson, Ont., refinery.

British American has been manufacturing asphalt at both Calgary and Moose Jaw, but the new equipment will permit the production of a wider range of high-quality product. The new equipment is now in operation at Calgary and was scheduled to go into production at Moose Jaw, September 1.

The units at these refineries consist of fractionating towers and furnaces together with necessary auxiliary equipment. They are designed to process about 2,200 bbl. per stream day of charging stock. The operation at Moose Jaw will be under the supervision of M. T. Stevens, refinery manager, and at Calgary under D. L. Campbell, manager. Virgin asphalt for roadway and industrial purposes will be produced at both refineries. The Calgary plant refinery has a listed crude capacity of 5,000 bbl. daily; that at Moose Jaw, 4,000 bbl. daily.

The new lubricating-oil facilities at Clarkson will permit the company approximately to double its present annual capacity for compounding and blending. Company officials empha-

AQUARIUM AIDS IN STUDY OF REFINERY WASTES

This aquarium of baby trout in the laboratory at Standard Oil Co. of New Jersey Baton Rouge (La.) refinery serves as a safety index for fish life in the Mississippi River where refinery effluents are discharged. The tests are carried out in cooperation with the Louisiana Department of Wildlife and Fisheries, Louisiana State University, and other state agencies to form the Louisiana Refineries Waste Control Council, whose purpose is to control stream pollution. So far tests indicate that fatalities among the fish are few. Those which have died in the aquarium have been subjected to conditions far in excess of those under which the fish will be actually exposed. These tests may prove valuable in developing recovery or conversion methods of valuable products from the effluents, as well as a greater life expectancy for fish. Dr. J. E. Miller of the Oil Conservation Department is the local refinery representative on the council. George F. Ullrich has charge of stream-pollution studies in the petroleum technical service department

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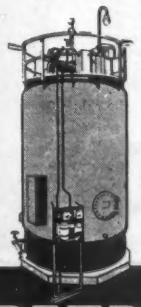

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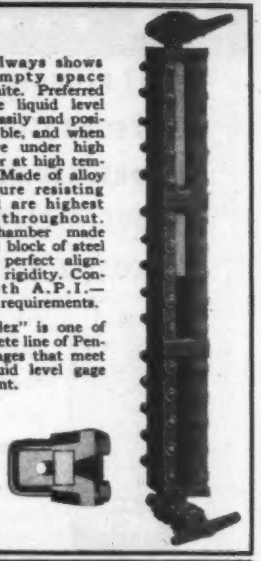

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sized the new facilities provide only for increasing compounding and blending of present production, although changes are being made in existing lubricating-oil production equipment at Clarkson to result in an increase of about 20 per cent in output.

About 40 employes will be needed for the new compounding and blending plant. Total cost of this project, including building, tankage, machinery, shipping facilities, etc., is $1,200,000. The Lummus Co. is design engineers, and Pigott Construction Co., Ltd., the general contractor. Work started last November and is expected to be fully completed this November.

The compounding and blending plant consists of a brick-enclosed steel-frame building about 100 by 325 ft. in size with a precast concrete roof. Most of the structure will be one story, but the center processing section will be about three stories high. Design allows additional floors to the one-story part later if required. The project also includes: railway and truck-loading facilities; laboratory facilities for control work; drum-reconditioning equipment; packaging and handling equipment; and office space for accounting and shipping staff. British American's Clarkson refinery has a crude capacity of 8,300 bbl. daily.

Petrol Terminal Corp. Buys U. S. Plant in Texas City

War Assets Administration in Washington September 5 approved sale of an aviation-gasoline plant in Texas City, Tex., to the Petrol Terminal Corp., Philadelphia, for $3,250,000. The plant is adjacent to American Liberty Oil Co.'s refinery.

Petrol Terminal will give the Army and Navy first call on 100 per cent of the refinery's output this year and an option on the same amount of its products next year. The refinery will process any petroleum products desired by the armed forces.

Sale of the Texas City refinery is the first disposal by WAA of an oil refinery since receipt of an appeal from the Army-Navy Petroleum Board that preference be accorded prospective purchasers of surplus oil facilities who agree to channel petroleum products to the armed services.

The refinery was sold to Petrol Terminal exclusive of royalty credits and personal property items. The plant consists of a complete Houdry six-case catalytic cracking unit with a gas plant and a HF alkylation unit designed for production of 100-octane gasoline. It produced 100,000 bbl. per month during the war.

The purchaser plans to make changes and add equipment that will make the facilities a complete modern refinery, WAA officials said.

Bay Installing New Units At Denver and McPherson

Engineers of Universal Oil Products Co. have been called on by Bay Petroleum Corp., Denver, to design and supervise the installation of new facilities to increase the yield and improve the octane rating of the gasoline produced in Bay refineries at Denver and McPherson, Kans., as well as to produce L.P.G.

A U.O.P. thermal reforming unit and a catalytic polymerization unit are being installed at Denver, and a thermal reforming unit at McPherson. Each of the refining units will be designed to raise the octane rating of 1,000 bbl. a day of low-octane, straight-run gasoline or naphtha. The facilities at Denver are being built by Bay's own construction force. The work at McPherson is being done by the Refinery Engineering Co., Chicago.

Bayonne Refinery Makes Record Runs

July was a record month for the Bayonne (N. J.) refinery of Tide Water Associated Oil Co. with a high level of operations brought on by the all-out effort to supply the present peak demand for petroleum products.

An average daily throughput of 75,029 bbl. was set during July as a new high. A new record for output in a single day was also established when 91,396 bbl. was run July 3.

Japanese Synthetic-Rubber Data Included in Report

Technical data on the manufacture of synthetic rubber by seven firms in Japan and Korea is contained in a military intelligence report released for public dissemination and now available from the Office of Technical Services, Department of Commerce.

Among the subjects covered are the manufacture of monomers, vinyl acetylene, butadiene, acrylonitrile, chloroprene, and their polymerization products. Flow sheets for these processes and for the manufacture of synthetic crepe are given.

Farben Process Analyzed

Additional data on polymeric chemical processes developed by Germany's Farben industry in recent years are contained in a British report available from the Office of Technical Services, Department of Commerce. Included in the report are brief descriptions of the chemical content and processing of "oppanols," "polythene," vinyl chloride polymers and copolymers, and "Igamids" (superpolymides).

NATURAL GAS

Temporary Permit Given East Ohio-Big Inch Line

WASHINGTON.—The Federal Power Commission has granted East Ohio Gas Co., Cleveland, temporary authorization to construct and operate 84 miles of 20-in. natural-gas pipe line in Ohio to receive gas from the Big Inch pipe lines into the East Ohio main system.

The commission stated also that it had set for September 17 in Washington a hearing on East Ohio's application for a certificate of public convenience and necessity for construction and operation of the line, cost of which has been estimated at $3,200,000.

In its application, East Ohio said it is presently buying about 47,000,000 cu. ft. of natural gas per day from Texas Eastern Transmission Corp., operator of the Big Inch. Contingent upon consummation of purchase of the Inch lines from the U. S. Government, Texas Eastern has agreed to sell increased supplies of gas to East Ohio. East Ohio has proposed to begin construction of the new line as soon as possible in order to receive the additional supplies.

East Ohio told FPC it will not give any new or additional service as result of construction of the new line as it is to be used to meet increased customer demands in the 83 communities the company already serves in Ohio.

Big Inch Oral Argument Reset for September 25

WASHINGTON.—The Federal Power Commission has postponed until September 25 the oral argument in the hearing on application of Texas Eastern Transmission Corp. for authority to operate the Big and Little Big Inch lines for natural-gas transmission. The oral argument, previously set for September 22, will be in Washington.

Oklahoma Utilities Group Plans Gas Division Meeting

Ways of preventing external pipe corrosion with expendable anodes will be discussed by W. E. Huddleston, Huddleston Engineering Co., Bartlesville, Okla., at a meeting of the gas division of the Oklahoma Utilities Association September 19 at the Biltmore Hotel, Oklahoma City.

Other papers on the program of the 1-day meeting deal mainly with subjects in the gas-distribution and sales fields. The program follows:

SEPTEMBER 19

10 a.m., morning session.—D. W. Reeves, general sales manager, Oklahoma Natural Gas Co., Tulsa, and chairman of the gas division of the association, presiding: "Report of Committee on Uniform Plumbing and Codes," E. C. McAninch, district manager, Oklahoma Natural Gas Co., Ardmore, Okla.; "Prevention of external Pipe Corrosion Through Use of Expendable Anodes," W. E. Huddleston, Huddleston Engineering Co., Bartlesville, Okla.; "Pressure Regulations on Town Plant Distribution Systems," K. R. D. Wolfe, Fisher Governor Co., Marshalltown, Iowa; and "Discovery and Control of Leakage in Town Plants," H. D. Portwood, chief engineer, general division of distribution, Lone Star Gas Co., Dallas.

12:15 p.m., luncheon.—Entertainment by Lauren H. Clegg, Consolidated Gas Utilities Corp., Oklahoma City.

2:00 p.m., afternoon session.—S. I. McElhoes, president, Oklahoma Utilities Association, presiding: "Gas Man's Civic Obligation," W. D. Little, editor, Ada (Okla.) News: "What's New in Heating," Carl H. Dean, sales director, Heating Research Corp., Muncie, Ind.; "Year-Round Air Conditioning," J. A. Gilbreath, sales manager, air-conditioning division, Servel, Inc., Evansville, Ind.; "Building a Commercial Load," L. J. Fretwell, Oklahoma Natural Gas Co., Tulsa.

Oklahoma Public Service Gas Properties Sold

Public Service Co. of Oklahoma has received permission from the Securities and Exchange Commission to sell its gas-production, transmission, and distribution properties to Consolidated Gas Utilities Corp. for $2,737,071.

Sale of the properties was ordered by the SEC on February 16, 1945, in accordance with provisions of the Holding Company Act.

New Mexico Carbon-Black Plant Placed on Market

A Eunice, N. M., carbon-black plant, designed to produce channel-type carbon black and currently operated under interim lease by Panhandle Carbon Co., is being offered for sale or lease by War Assets Administration.

The plant consists of 168 burner buildings, processing building, bag storage building, warehouse, machine shop, change house, office building and a treater plant including a gas purification system, boiler house, office, laboratory, warehouse, spray ponds, and 8½ miles of 20-in. pipe. At present, natural gas for the plant is being supplied by Phillips Petroleum Co. under contract with Panhandle Carbon.

Bids will be received by WAA's regional office in Denver until September 17.

Natural Gasoline

Harrington & Marsh Build Guymon-Hugoton Gas Plant

Harrington & Marsh, Amarillo, Tex., have commenced construction of a new natural-gas processing plant about 3 miles southwest of Hooker in the Oklahoma Panhandle.

The firm owns about 80,000 acres of leases in the proved gas area in Texas County, Oklahoma, upon which a development program was commenced in March 1946. Gas produced from this acreage will be delivered to Natural Gas Pipeline Co. of America as soon as that company's facilities are completed into the Texas County field. The pipe-line company will construct a 26-in. lateral line from the plant site to their main system and expect to begin receiving gas about August 1, 1948.

Under a contract with the pipe-line company, Harrington & Marsh are to install a field gathering system for the delivery of gas from their wells to the compressor station of the pipeline company which, after boosting the pressure to 750 psi., will redeliver the gas to the Harrington & Marsh plant for dehydration and gasoline extraction after which it will be returned to the pipe line.

The processing plant will contain several innovations. J. F. Pritchard & Co., Kansas City, have the contract for the engineering and erection of the plant which is estimated to cost approximately $1,500,000 and have a capacity of about 100,000,000 cu. ft. daily. Earl Nutter, general plant superintendent for Harrington & Marsh, is responsible for the process design of the plant and will have supervision of its construction and operation.

The Rock Island Railroad is now completing a double spur to this plant site. Production and pipe-line operations of the firm are under the supervision of L. M. Batten, general production superintendent with offices in Guymon, Okla. The firm has completed about 55 wells in the development program and expects to drill about 70 more during the next 2 years. All drilling has been done with company tools under Joe Wyant, Guymon. Until construction of the various facilities is completed, gas production from the firm's wells will continue to be delivered to Cities Service Gas Co. and Cabot Carbon Co.

This is a picture of a Link-Belt inspector engaged in assuring the efficient performance of Link-Belt Bearings. This, indeed, is ruthless, uncompromising inspection which greatly magnifies the image of the raceway and compares its profile with the master curve gauge. In the battle against friction, Link-Belt bearing designers and producers ask no quarter, nor do they give one. Link-Belt invites you to put your bearing problems in their hands.

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4 Outside rotating member develops full flinger action.

5 Unit completely sealed at factory for permanent protection of bearing parts.

6 Knurled cup points firmly lock set screws in place.

7 True flat surface assured for nut pressure surface.

8 Compact, solid housing requires minimum support space. Base spotted for drilling for dowel pins. Elongated bolt holes facilitate alignment and assembly.

9 Ample grease reservoir.

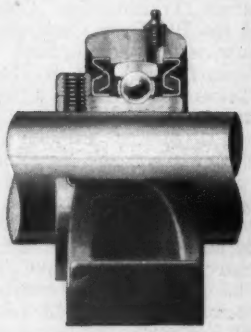
10 Extended inner race distributes bearing load over large shaft area.

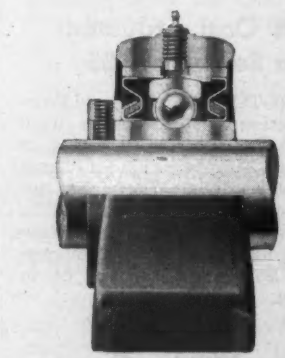
11 Double setscrewed collar locks inner ring assembly to shaft.

12 Hydraulic grease fitting conveniently located at 45° from horizontal center-line of bearing.

13 Locking plug equipped with hydraulic type grease lubrication fitting, conveniently located outside and allows axial movement of the cartridge.

14 Steel inner housing, completely assembled with bearing and seals, is free to float in bore of outer housing. Cartridge treated to prevent rust, assuring free axial movement, eliminating heavy thrust loads.





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PIPE LINES

Gas Industrial Serving Industries in Monterrey

Industries in Monterrey, Nuevo Leon, Mexico, are now receiving gas from the 14-in. pipe line constructed by Gas Industrial de Monterrey, S. A. Genaro Cueva is president of this company's executive commission. The project for constructing the 135-mile natural-gas transmission line between Reynosa and Monterrey, as well as the city distribution system serving industries in Monterrey, has been under the direction of J. F. Price, Jr., chief engineer and construction superintendent.

Construction operations of the contractor, Contratistas Del Norte, S. A., subsidiary of O. C. Whitaker Co., were supervised by T. M. Tatom, spread superintendent. H. C. Arthur, assistant-superintendent, had charge of the construction of the city distribution system.

This line is of much significance for expansion of the industries in Monterrey which have been impeded by lack of adequate fuel. Although Monterrey is the third city of Mexico in population, it is the first city in industrial importance. Industries served by this system are: Compañía Fundidora de Fierro y Acero de Monterrey, S. A. (steel); Fábrica de Ladrillos Industriales y Refractarios, S. A. (fire-brick and refractories); Cementos Mexicanos, S. A. (portland cement); Cementos del Norte, S. A. (blast furnace slag cement); Troqueles y Esmaltes, S. A. (enameled ware); Vidriera Monterrey, S. A. (bottles, glass jars); Vidrio Plano, S. A. (window glass); Cristaleria, S. A. (household glassware for tables); Vidrios y Cristales, S. A. (decorated glassware); Malta, S. A. (preparation of grains for the brewery); Fábricas Monterrey, S. A. (bottle caps and lithographed sheet metal specialties); Cerveceria Cuauhtemoc, S. A. (manufacture of beer); Planta Electrica Grupo Industrial (generation of steam and electricity); Empaques de Cartón Titán, S. A. (manufacture of paper and cardboard containers); Hojalata y Lamina, S. A. (plating and rolling sheet metals); Fabricación de Maquinas, S. A. (manufacture of industrial equipment); and Keramos, S. A. (chinaware).

Gas for the line is received from Reynosa Pipe Line Co.'s 17-mile 12-in. line in Texas recently laid by Ladewig Engineering Co. There are no compressors on the line since the wells near Weslaco, Tex., have a rock pressure of 2,400 psi. The system has been designed for delivery at an ultimate capacity of 50,000,000 cu. ft. per day.

Stanolind to Expand In West Texas, Wyoming

Stanolind Pipe Line Co. will start laying pipe this fall for the 80-mile, 16-in. Wasson-Wheeler, Tex., extension of its 16-in. West Texas-Drumright, Okla., crude-oil line which in turn will be looped with 265 miles

Meter house of Gas Industrial de Monterrey, S. A., being constructed in the yard of the steel mill of Cia. Fundadora de Fierro y Acero, S. A., while the 135-mile, 14-in. Reynosa, Tex.-Monterrey, Mexico, gas line was being completed by Contratistas del Norte, S. A. (O. C. Whitaker Co. affiliate). The meter house just beyond is at the terminal of the gas line from Texas owned by Cia. Mexicana de Gas, S. A.

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of 16-in. between Slaughter, Tex., and Drumright in the first half of 1948. The Post pool-Petersburg, Tex., 50-mile line will probably be built of 8-in. instead of 6-in. as originally planned.

In Wyoming the Stanolind company will lay the 130-mile, 8-in. Casper-Wamsutter crude-oil line, starting May 1, 1948, and the Lysite-Casper 70-mile, 12-in. looping in the second half of 1948. Between Casper and Freeman, Mo., the company will lay 199 miles of loops, including 81 miles of 12-in. and 118 miles of 16-in.

With the completion of the 260 miles of 20 and 22-in. loops now under construction between La Plata, Mo., and Manhattan, Ill., Stanolind will have a continuous big-inch line from Drumright, Okla., to Whiting, Ind. The remainder of the line was built in previous looping with 20-in. from Drumright to La Plata and with 18-in. from Manhattan to Whiting.

Cities Service to Lay 245 Miles of Kansas City Line

Cities Service Gas Co. expects to have 90 miles of pipe on May 1, 1948, for laying the first part of the Hugoton field outlet to be built during 1948 and 1949 to Kansas City. The entire project will total approximately 405 miles of 26-in. when completed.

In 1948 it is reported that the company expects to have only sufficient pipe to lay 245 miles. Work in 1948 will start on the Ulysses-Hutchison, Kans., 200-mile section. Later in 1948 the Ottawa-Kansas City 45-mile section will be laid.

The remainder of the pipe for completing the project in the Hutchison-Ottawa gap will be laid in 1949. Decision to lay the Ottawa-Kansas City section in 1948 was not reached until recently.

Cities Service Starts Guthrie-Drumright Line

Cities Service Gas Co. is starting construction this week for laying the 47-mile Guthrie-Drumright, Okla., natural-gas line which will have 15 miles of 16-in. and 32 miles of 12-in.

Mississippi River Fuel To Expand

The Federal Power Commission has set September 15 in St. Louis for a hearing on a request of Mississippi River Fuel Corp. for authorization to construct pipe lines to increase the capacity of its natural-gas pipe-line system by 83,000,000 cu. ft.

Proposed construction consists of a series of loop lines to provide two separate lines from the Perryville compressor station in Louisiana to

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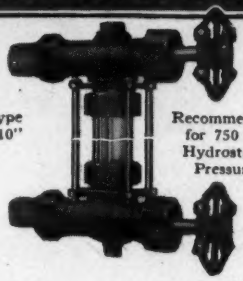

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St. Louis and installation of an aggregate of 11,000 additional horsepower at the Perryville, West Point, and Twelve Mile compressor stations.

The looping would include about 189 miles of 22-in. line, 23 miles of 12-in. in 4-line manifolds at creek crossings. Total cost of the project has been estimated at $11,083,715.

After installation of the new facilities, the company would have a daily capacity of 275,000,000 cu. ft. at its Perryville station.

Bayou System Pumps 40,000 Bbl. Daily

Bayou Pipe Line System is pumping refined products into the Baton Rouge terminal of Plantation Pipe Line Co. at an average rate of 40,000 bbl. daily. The wartime high throughput for this system was 68,000 bbl.; subsequently, four stations were removed from the line.

Interstate Prepares for Canadian River Crossing

Interstate Oil Pipe Line Co. is having certain contracting firms make proposals in preparation for laying a Canadian River crossing for its Oklahoma City - Maysville crude-oil pipe line on which construction has already started.

The contractor, Standard Pipe Line Construction Co., has laid 2.2 miles of 12-in. for the project extending northward from the Maysville end; this firm has also recently laid 7 miles of 6-in. northeast to the Lindsay pool. At the Ouachita River crossing 12-in. has been laid for this project.

Lone Star Removes Line in Graham Area

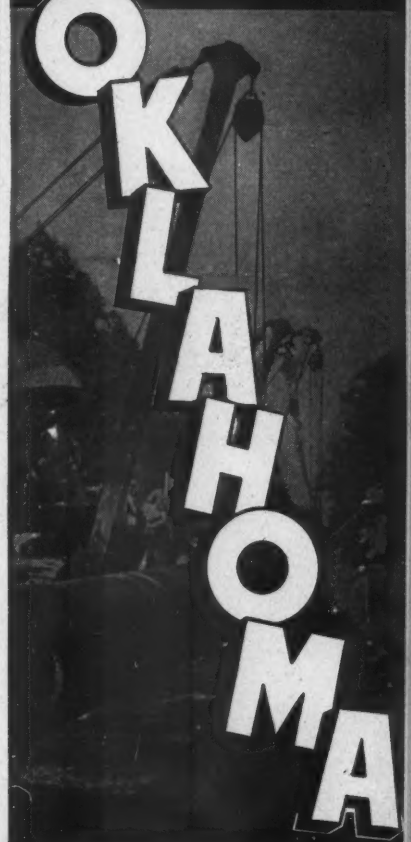
Lone Star Gas Co. let contract to Oklahoma Contracting Co. to dig up and remove 28½ miles of the company's system in the area between Graham and Brad, Tex.

Mountain Fuel Supply to Build New Gas Line

Mountain Fuel Supply Co., distributor of Utah and Wyoming natural gas in the Salt Lake City, Utah, area, has announced construction of approximately 35 miles of gas line from a main-line junction to the towns of Provo, Orem, Springville, Lincoln and Spanish Fork, Utah.

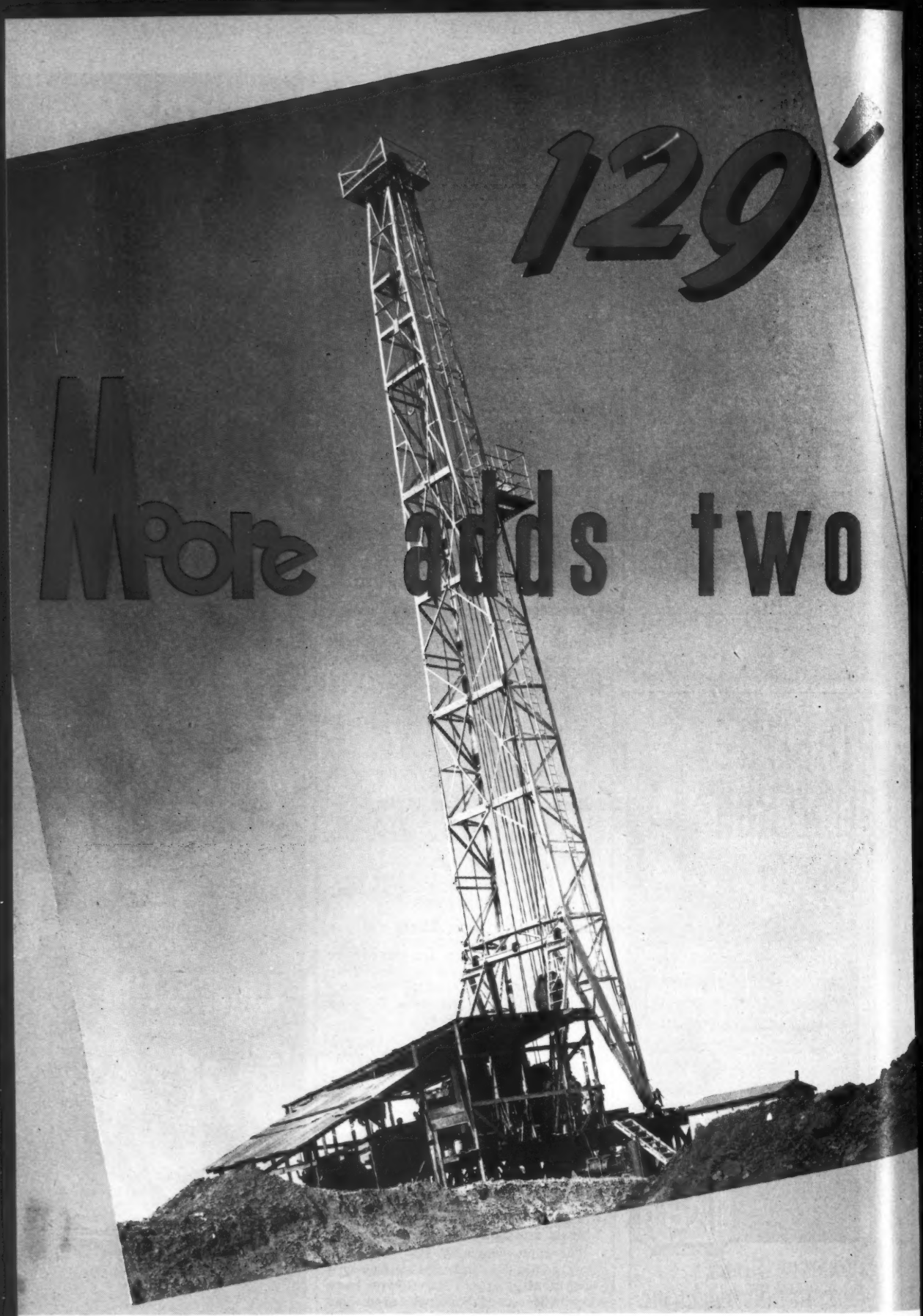
The new line will cost approximately $850,000, and construction will start next spring. These towns have previously used manufactured gas distributed by Mountain Fuel.

IT HAS TO BE OK IF



OKLAHOMA CONTRACTING CO. INC. DOES IT

MERCANTILE BANK BLDG.
DALLAS, TEXAS



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Exploration and Drilling

East Texas Gets New Pettit Pool

A NEW Pettit zone pool appears reasonably sure in northern Anderson County, in East Texas, with Sanders & Murchison preparing to complete their 1 Broadway in the Pettit zone from perforations at 9,736-40 ft. and 9,750-58 ft., probably good for around 300 bbl. of 44°-gravity oil.

The well is about 3 miles east of the town of Blackfoot, and is located on the Blackfoot Dome, a surface structure well known for many years. This structure lies about 6 to 10 miles east of Cayuga field. Blackfoot Dome has a surface closure of around 150 ft., perhaps more. It is a very large feature, extending about 15 miles north and south, by about 6 miles east and west.

The Sanders & Murchison test is located well down on the east flank of the structure, about midway north and south. The area is reported to have been seismographed, and the location of the present well according to the surface structure would indicate that there must be evidence that the structural axis shifts with depth. The shift, if any, would be in the direction of normal regional dip. On surface structure, the location is 75 to 100 ft. below the crest.

About 2 miles west and a little south, Hunter et al 1 Gage, a 9,000-ft. dry hole, was drilled in 1937 in the B. Gilbert Survey. Several Woodbine tests have been failures on this large structure. Surface elevation on the discovery well is 328 ft. compared to 378 ft. on the 1 Gage.

KANSAS

Two Prospective Pools For Stafford County

PROSPECTS looked good for the opening of two new Arbuckle pools in Stafford County. Musgrove Petroleum Corp. and C-G Drilling Co. 1 Lanterman, NW NW NW 23-22-12, a mile west of the Heyen pool, swabbed 50 bbl. of oil per hour for 3 hours from 1,000 ft. off bottom, total depth 3,675 ft. after a 500-gal. acid treatment. Arbuckle top is 3,672 ft., datum —1,806 ft.

About 15 miles northwest and 1¾ miles west of the Hazel pool, Stanolind Oil & Gas Co. 1 Pundsack, SE SE SW 19-21-13, is estimated good for 300 bbl. from Arbuckle topped at 3,735 ft., datum —1,814 ft. Total depth is 3,743 ft., and after acidizing with 500 gal., the well swabbed 8 bbl. of oil per hour from 400 ft. off bottom.

In Rice County, Phillips Petroleum Co. 1 Newkirk, SE NE NW 11-18-7, made a small pumper, good for 25 bbl. of oil and an equal amount of water per day from the Lansing, after plugging back from total depth of 3,487 ft. in the Arbuckle.

In Pratt County, Lion Oil Co. 1 Curry, NW NW NW 25-29-12, was preparing to abandon at total depth of 4,775 ft., after topping Arbuckle at 4,710 ft.

KANSAS SUCCESSFUL WILDCATS

Graham County: Wilcox & B. & R. 1 Rush, NE NW NE 9-6s-22w, pumped 297 bbl. of 33°-gravity oil per day from Lansing-Kansas City at 3,506-14 ft.; anhydrite 1,923 ft., Topeka 3,271 ft., Heebner 3,463 ft., conglomerate 3,798 ft., Arbuckle 3,831-73 ft., TD 3,873 ft.

Rooks County: Continental Oil 1 W. J. Gilbert, NE NE SE 6-9s-18w, pumped 609 bbl. of 22.7°-gravity oil per day from Arbuckle at 3,489-92 ft.; Lansing 3,238 ft., TD 3,492 ft.

KANSAS WILDCAT FAILURES

Barton County: El Dorado Refining 1 Archer, NW NW SW 16-19s-15w, dry, TD 3,617 ft., anhydrite 920 ft., Kansas City 3,270 ft., conglomerate 3,543 ft., Arbuckle 3,607 ft., Regan 3,610 ft.

Butler County: D. Ingling 1 Foltz, NE NE NE 24-24s-7e, dry, TD 2,775 ft., Bartlesville 2,648 ft., Mississippian 2,750 ft.

Cowley County: E. H. Adair 1 Ratley, SE SE NE 16-30s-3e, dry, TD 2,607 ft., Topeka 1,510 ft., Stalnaker 2,004 ft., Kansas City 2,582 ft.

Marion County: El Dorado 1 Firebaugh, SE SE NE 13-19s-4e, dry, TD 2,377 ft., conglomerate 2,266 ft., Mississippi chat 2,308 ft., Mississippi lime 2,366 ft.

Pawnee County: J. J. Lyon 1 Petro, NE SW NE 33-23s-15w, dry, TD 4,226 ft., anhydrite 945 ft., Heebner 3,516 ft., brown lime 3,654 ft., Lansing 3,665 ft., Basal Kansas City 3,935 ft., cherty conglomerate 4,000 ft., cherty Viola 4,014 ft., Arbuckle 4,196 ft.

Phillips County: Wilcox & B. & R. 1 Albright, NW NW SW 21-4s-20w, dry, TD 3,602 ft., anhydrite 1,660 ft., Heebner 3,230 ft., Lansing 3,254 ft., Basal Kansas City 3,485 ft., Arbuckle 3,547 ft.

Rush County: Sohio & Lion 1 Wilson, NE NE NE 31-17s-18w, dry, TD 3,929 ft., anhydrite 1,260 ft., Topeka 3,132 ft., Heebner 3,433 ft., Lansing-Kansas City 3,484 ft., conglomerate 3,843 ft., Arbuckle 3,894 ft.

Russell County: El Capitan Oil 1 Hoke, NE NW SE 14-13s-12w, dry, TD 3,251 ft., anhydrite 715 ft., Tarkio 2,360 ft., Topeka 2,635 ft., Kansas City 2,950 ft.

Sedgwick County: Parker Drilling 1 Glenn Huss, SE SE SE 24-25s-3w, dry, TD 4,090 ft., Lansing 2,630 ft., chat 3,439 ft., Mississippi lime 3,472 ft., Hunton 3,883-3,904 ft., Viola 3,926 ft., Simpson dolomite 3,944 ft., Simpson sand 3,958 ft., Arbuckle 4,051 ft.

Stafford County: Huber Corp. 1 Smith, C NW SW 10-24s-15w, dry, TD 4,218 ft., anhydrite 880 ft., Lansing 3,684 ft., conglomerate 4,037 ft., Viola 4,052 ft., Simpson 4,095 ft., Arbuckle 4,168 ft.

Virginia Drilling 1 Rusco, SW SW NW 32-22s-13w, dry, TD 3,998 ft., anhydrite 795 ft., Lansing 3,502 ft., Viola 3,858 ft., Arbuckle 3,694 ft.

OKLAHOMA

Old Shallow Area Gets Wild Well

AFTER being out of control for nearly 6 days, W. A. Fleming et al 3-A Harjo, NW SE NW 16-10n-11e, in the Weeletka area of Okfuskee County, was shut in. This well, in an old area, was being drilled with cable tools and had around 400 ft. of casing in the hole, when the Salt sand at 1,636-41 ft., usually only a small producer, blew in, flowing an estimated 35 to 50 bbl. per hour.

Warren Oil Corp. 1 Burgess, Noble County Wilcox discovery in NE SE NW 8-21n-1w, flowed 100 bbl. in the first 24 hours and 50 bbl. in the second, through 10/64-in. choke. Two offsets have been announced.

Stanolind Oil & Gas Co. 1 Witcher, SW SW 30-13n-2w, a mile south and 1½ miles west of the Witcher gas-condensate pool, reported swabbing 2 bbl. of oil per hour from the Bois d'Arc Hunton at 6,363-6,406 ft., prior to acidizing. It was then acidized with 1,000 gal., and began flowing the load oil.

Mudge Oil Co. 1 Sembritzky, SE NW SE 24-1n-7w, Stephens County, a potential pool opener on basis of drill-stem tests in the Hoxbar at 7,185-200 ft., which made 20 bbl. per hour, has set casing and is preparing to test. Stanolind 1 Sims, NE NE SE 2-1s-4w, same county, has salvaged a 118 bbl. pumper from the Springer sand, after drilling to a total depth of 6,759 ft. Mississippi Caney top is reported to have been 6,685 ft.

In Hughes County, a shallow gas discovery rated at 1,500,000 cu. ft. was registered by J. T. Hall 1 Burkett, SW SW SE 34-8n-10e, producing from the Salt sand, topped at 1,960 ft., total depth 1,968 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Hughes County: J. T. Hall 1 Burkett, SW SW SE 34-8n-10e, 1,500,000 cu. ft. of gas from sand at 1,960-68 ft.; sand 1,952-56 ft., shale 1,956-60, TD 1,968 ft.

Lincoln County: Davon Oil 1 Dye, SE SW NW 15-14n-5e, flowed 489 bbl. of distillate per day from Prue at 3,370-3,422 ft., 49° gravity, through ¼-in. tubing choke, Avant 1,950 ft., Hogshooter 2,210 ft., Checkerboard 2,610 ft., Cleveland 2,640 ft., TD 3,422 ft.

Oklahoma County: New pay in Witcher pool—Oklahoma Natural Gas 1 Lair, C SW SW 21-13n-2w, flowed 18 bbl. of distillate and 54,000,000 cu. ft. of gas from Bois d'Arc at 6,120-40 ft.; Oswego 5,785 ft., no Bartlesville, unconformity sand 6,107-12 ft., TD 6,171 ft.

Payne County: L. G. Wheeler & Johnson Oil & Refining Co. 1 Sorick, NW NW NW 19-19n-4e, pumped 70 bbl. of 35° gravity oil per day from 3,774-3,800 ft.; Avant 2,140 ft., Layton 2,475 ft., Hogshooter 2,550 ft., Checkerboard 3,130 ft., Cleveland 3,145 ft., Skinner 3,625-32 ft.,

Whether you store 5,000 gallons

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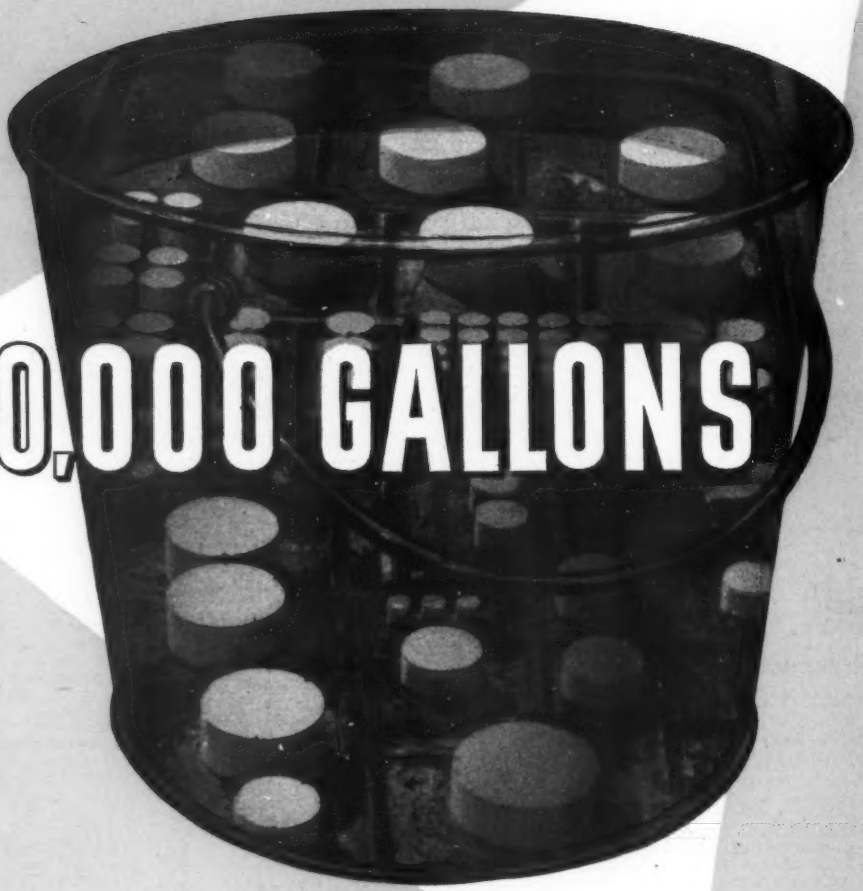

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Inola 3,708 ft., Bartlesville 3,718 ft., Mississippian 3,995 ft., Woodford 4,095 ft., Viola 4,183 ft., Deese 4,215 ft., dolomite 4,230 ft., Wilcox 4,245-56 ft., second Wilcox 4,270 ft., TD 4,281 ft.

Pottawatomie County: New pool—Phillips et al 1 Chapman, NW SE NW 1-10n-4e, pumped 78 bbl. of 31.7°-gravity oil from Bartlesville at 4,127-50 ft.; Avant 1,940 ft., Belle City 2,035 ft., Hogshooter 2,450 ft., Layton 2,495 ft., Checkerboard 2,790 ft., Inola 4,100 ft., TD 4,150 ft.

Seminole County: New pay in West Bethel pool—McIntyre, Sherman & Cummings 1 Brown, SW SE NE 14-9n-7e, pumped 40 bbl. of oil from Booch at 3,230-70 ft., TD 4,337 ft., OWPB to 3,385 ft.

Clarge C. Nye 1 Wilson, NE SW SE 2-5n-7e, flowed 90 bbl. of 39°-gravity oil from Gilcrease at 2,633-63 ft. through ¾-in. tubing choke, no other tops reported, TD 2,663 ft.

Stephens County: Stanolind 1 Sims, NE NE SE 2-1s-4w, pumped 118 bbl. of 28.9°-gravity oil from sand at 4,720-4,894 ft., Fusilinid lime 3,186-3,260 ft., Tussy sand 3,399 ft., Basal Tussy sand 3,469 ft., Springer 4,040 ft., Mississippian Caney 6,685 ft., TD 6,770 ft.

Skelly et al 1 Horton, NW NE SW 14-

(Continued on page 156)

PERMIAN BASIN

More Pay Thickness in Ector County Discovery

MIDLAND.—A second drill-stem test at Phillips Petroleum Co. and The Texas Co. 1 McEntire, Ector County discovery 2 miles southeast of the Andector field, indicated an additional 47 ft. of pay in the Ellenburger. The first test, at 8,048-8,133 ft., brought gas to the surface in 8 minutes, and oil in 18 minutes; then flowing 102 bbl. of oil during the next 50 minutes. The test in the lower section of the pay, from 8,131-80 ft., put gas to the surafce in 6 minutes but did not flow oil. When the tool was pulled, after being open 2 hours, the recovery was 100 ft. of oil-cut mud and 6,820 ft. of clean oil. Operators were to deepen the well, but have already rated it at approximately 3,000 bbl. daily potential. The 1 McEntire logged some 200 ft. of saturated dolomite in the Clear Fork between 6,150-6,350 ft., and flowed at the rate of 650 bbl. of oil a day on a 2½-hour drill-stem test from 6,125-6,200 ft.

Phillips Petroleum Co. 1-P TXL, northwest outpost to TXL, set casing to 7,950 ft., drilled out to 7,960 ft., and was running 2-in. tubing to test. Total depth is 8,435 ft.

Sterling County's prospective Ellenburger discovery, Plymouth Oil Co. 1 Mrs. George Frost, cemented perforations at 8,310-20 ft. in an effort to shut off water. Operators were to drill plugs and condition the hole for further testing.

In southwest Andrews County, Lion Oil Co. 1-B Tennie, ½-mile west extension to the Dollar Hide field, logged additional pay in the Devonian. This section, topped at 8,457 ft., and tested from 8,457-72 ft., recovered 540 ft. of oil and gas-cut drilling mud in 1 hour. Operators were to deepen to 8,500 ft. and retest. Previously, at 8,309-71 ft., flowing through 5/8-in. bottomhole choke, gas came to the surface in 4½ minutes, mud in 48 minutes and oil at the end of 56 minutes. It was allowed to clean for 4 minutes then turned into storage. The first hour it flowed 16 bbl. of oil, cut 4 per cent by drilling mud. Flowing bottomhole pressure was 750 psi. A second test from 8,386-8,430 ft., open 1 hour, recovered 1,204 ft. of drilling mud, with no shows of oil, gas or water, in 50 minutes. Operators said the section might correspond to a blank zone separating pay zones in other wells in the field.

Argo Oil Corp. staked its second deep test in Reeves County, 12 miles northeast of Balmorhea. The company's 1 Ikins, Section 293, Block 13, H&GN Survey, is located 1 mile south by southwest of the 1 Dora Roberts, Wolfcamp discovery, at 9,810 ft. The new test is scheduled to drill to 11,000 ft.

WEST TEXAS WILDCAT FAILURES

Dawson County: Childress Royalty Co. 1 Lillian Scanlon, Sec. 83, Blk. M. ELRR Sur., 3½ mi. W Welch field, dry, TD 5,000 ft., brown lime 4,000 ft., San Andres 4,620 ft., elevation 3,141 ft.

Ector County: Humble Oil & Refining Co. 1-B J. E. Parker, Sec. 2, Blk. 45, T&P Sur., 1¼ mi. SE TXL field, dry, TD 5,960 ft., top Clear Fork 5,670 ft., elevation 3,174 ft.

Gaines County: Union Oil Co. of California 1 A. A. Kuehn, Sec. 16, Blk. C-44, PSL Sur., 2 mi. SE Seminole field, dry, TD 5,305 ft., anhydrite 2,150 ft., San Andres 4,908 ft., elevation 3,266 ft.

Reeves County: John J. Ivy 1 W. E. Bell & K. M. Regan, Sec. 28, Blk. 2, H&GN Sur., 1 mi. S Irabel, dry, TD 700 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Southeast of the Hardy field, Lea County, Stanolind Oil & Gas Co. 1 Southland Royalty Co., SW NE 8-21s-37e, reported a recovery of 5,000 ft. of clean oil, with no water, on a drill-stem test at 6,530-62 ft. in the lower Permian. Operators drilled ahead to 6,684 ft. and prepared to take another test. Originally, the well was scheduled to 8,000 ft., unless production was found at a lesser depth. Flowing bottom-hole pressure varied from 450 to 700 psi., increasing to 2,500 psi. when shut in 15 minutes. Total recovery on the 50-minute drill-stem test included 100 ft. of heavily oil and gas-cut mud.

In west central Lea County, Cole-Darden Oil Co., Midland, Tex., 1 Phillips-State, SE SE 3-17s-34e, recovered 480 ft. of gas-cut mud and 380 ft. of oil-cut mud on a 90-minute drill-stem test of the San Andres at 4,609-60 ft. Flowing bottom-hole pressure was 250 psi., with shutin pressure at 900 psi. Operators were to set casing at 4,330 ft., in the top of the Grayburg section, which also had oil saturation. Including saturation in the Grayburg, operators reported a total of 50 ft. of porous formation promising production. If successful, it will be a 1½-mile west extension to San Andres production in the Vacuum field.

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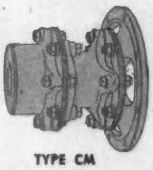
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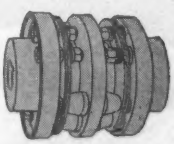
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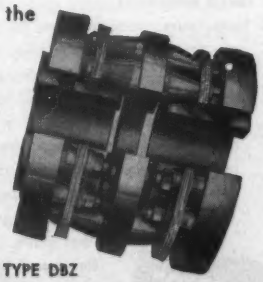
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SOUTHEASTERN NEW MEXICO WILDCAT FAILURES

Eddy County: Don Oliver 1 Smith, 29-17s-27e, dry, TD 2,514 ft., red sand 990 ft., hole full of water at 1,300 ft.

Lea County: Culbertson-Irwin, Inc. 1 Shepherd, 1-21s-32e, dry, TD 3,445 ft., salt 1,690 ft., Yates 3,201 ft., elevation 3,783 ft.

Mid-Continent Petroleum Corp. 4 Lynch, 1-22s-37e, dry, TD 7,236 ft., deep test in Brunson field, Tubbs 5,990 ft., 144,000 cu. ft. gas a day at 6,344 ft., slight show oil.

TEXAS PANHANDLE WILDCAT FAILURE

Collingsworth County: S. D. Johnson et al 1 Wischkaemper, 4½ mi. N Lutie, dry, TD 2,310 ft., limestone 1,905 ft., show gas 2,050 and 2,100 ft.

SOUTHWEST TEXAS

New Shallow Pool For Duval County

CORPUS CHRISTI.—A new oil pool 1½ miles southwest of Hoffman field and 3½ miles east of East Peters field, in Duval County, has been opened by Cox & Hamon and George Coates 1-A J. R. Dougherty, in the Eliz. J. Gravis Survey 508. On potential test this well flowed 23 bbl. of 22°-gravity oil per day on the pump through perforations at 2,278-80 ft. Top of the pay sand was 2,276 ft., and total depth is 2,317 ft. Gas-oil ratio 160, with no water in the flow. The pay sand is shallower than any of the oil pay zones at Hoffman field, and apparently is in the Frio zone. The operators have now set casing at 2,340 ft. in their 2-A J. R. Dougherty, 660 ft. southwest of the 1-A discovery well.

Also in Duval County, Butcher-Arthur, Inc. and Taylor Refining Co. 1 M. Serna, in Survey 290, opened a new oil pay in Robinson pool. This well was originally completed through perforations at 4,004-10 ft., was reworked and completed through perforations at 3,915-26 ft., with top of new pay at 3,905 ft. On potential test flowed 35 bbl. of oil per day through a 3/16-in. choke, gas-oil ratio 686 cu. ft. with tubing pressure 480 psi., and casing pressure 800 psi. Gravity is 46.9°.

Magnolia Petroleum Co. 1 Lohmann, 1¼ miles southeast of south flank oil production at La Gloria field, Brooks County, is testing a new deeper producing zone for the field. Through perforations at 8,795-8,828 ft. it gaged 43 bbl. of condensate, 12 bbl. water, and 3,000,000 cu. ft. gas per day through a 5/16-in. choke, with 1,395 psi. working pressure. Operators are still testing.

Selby-Walker Corp. 1 Garcia, wildcat just east of Boyle field, in Starr County, perforated at 3,410-20 ft., and tested dry gas through a ⅛-in. choke, with 825 psi. flowing pressure on tubing and casing. Total depth is 4,008 ft., with 5-in. casing set to 3,472 ft. This well is in Mrs. J. S. Goodwin Survey 913.

Charlotte field in Atascosa County has been extended 1½ miles southwest by Kirkwood & Morgan, Inc. et al 1 Marrs McLean, in J. Poitevent Survey 1, which gaged 126.5 bbl. of oil per day through a 3/16-in. choke (X-39), on potential gage. Gas-oil ratio 326 cu. ft. Production is through perforations at 6,161-67 ft. in the Navarro sand. Top of Navarro sand 5,156 ft., and total depth 5,236 ft. Sand with oil show was logged at 5,156-69 ft., 5,174-96 ft., 5,201-04 ft., and 5,219-36 ft.

Standard Oil Co. of Texas 38 Mestena Oil & Gas Co., in La Mestena Grant, opened a new pay for Alta Mesa field, Brooks County. Top of new pay 4,517 ft., total depth 5,907 ft. A dual-completed well. On potential test through perforations at 4,517-20 ft., flowed 110 bbl. oil per day through 3/16-in. choke, gas-oil ratio 393 cu. ft. Top of pay at 4,560 ft., with perforations at 4,560-64 ft., flowed a potential of 47 bbl. of oil per day through a 9/64-in. choke, gas-oil ratio 1,286 cu. ft., tubing pressure 300 psi., casing sealed, gravity 46.9°, no water.

There were 27 new locations reported this week with 6 being wildcats, 2 in Duval and 1 each in Bastrop, Caldwell, Edwards and San Patricio counties. Two new pays were opened in Brooks County, one oil in Alta Mesa field and one condensate in La Gloria, one new oil pool and one new oil pay in Robinson pool, in Duval County. Seven wildcats were dry, 3 in Duval, 2 in Webb and 1 each in San Patricio and Starr counties.

SOUTHWEST TEXAS SUCCESSFUL WILDCATS

Brooks County: New oil pay Alta Mesa field—Standard Oil Co. of Texas 38 Mestena Oil & Gas Co. 1, in La Mestena Grant, dual completion: top pay 4,517 ft. (new sand), TD 5,907 ft., perf. 4,517-20 ft., IP: 110 bbl. oil per day through 3/16-in. choke, gas-oil ratio 693 cu. ft., CP 425 psi., gravity 46.9°, top pay 4,560 ft., perf. 4,560-64 ft., IP: 47 bbl. oil per day through 9/64-in. choke, gas-oil ratio 1,286 cu. ft., TP 300 psi., casing sealed, gravity 46.9°, no water.

New condensate pay, La Gloria field—Magnolia Pet. Co. 1 Lohmann Hrs., in Falfurrias Farm & Garden Tracts, ½ mi. NE of Falfurrias, on SE flank of field, top pay 8,795 ft., TD 9,200 ft., perf. 8,795-8,828 ft., IP: 2,460,000 cu. ft. gas per day and 39 bbl. condensate per day through 5/17-in. choke, ratio 62,500 cu. ft., TP 1,215 psi., casing sealed, 90.3 bbl. of salt water per day.

Duval County: New oil pool—Edwin B. Cox & Jake L. Hamon & Geo. H. Coates 1-A James R. Dougherty, in Eliz. J. Gravis Survey 508, 12 mi. S of Freer, top pay 2,276 ft., TD 3,316 ft., perf. 2278-80 ft., IP: 23 bbl. oil per day on pump, gas-oil ratio 160 cu. ft., gravity 220°, no water.

New oil pay Robinson pool—Butcher-Arthur, Inc., & Taylor Refg. Co. 1 M.

LEGAL

CALL FOR BIDS.—To sell royalty crude oil accruing to the United States. Sealed bids, in duplicate, will be received in the office of the Director of the Geological Survey, Room 5244 Federal Works Agency Building, Washington 25, D.C., on or before noon, d.s.t., September 16, 1947, and publicly opened at 2:00 p.m., d.s.t., on that day, for the sale of certain royalty crude oil accruing to the United States from Federal lands in the Bronson, Eaves, Eunice - Monument, Grayburg - Jackson, Maljamar, and Rhodes pools, all in Eddy and Lea Counties, New Mexico. No bid received after the time fixed herein for submitting bids will be considered. Contracts for the royalty oil will be for a term of 3 years beginning the first day of the calendar month following execution by the Secretary of the Interior. The monthly royalty oil accruals offered for sale under seven items are approximately as follows: 1,400 barrels from the Bronson pool; 2,160 barrels from the Eaves pool; 14,900 barrels from the Eunice-Monument pool; 970 barrels of unitized and 9,100 barrels of nonunitized oil from the Grayburg-Jackson pool; 14,600 barrels from the Maljamar pool; and 3,000 barrels from the Rhodes pool. Specifications on the quantities of crude oil offered for sale, the form of bids, the form of contract, and the conditions with respect to bond requirements, deliveries, volume measurements, gravity determinations, and other details relating to the call for bids may be obtained from the Director, Geological Survey, U.S. Department of the Interior, Washington 25, D.C., or the Oil and Gas Supervisor, U.S. Geological Survey, P.O. Box 997 (332 Federal Building), Roswell, New Mexico. Sealed bids must be submitted to the Director of the Geological Survey, U.S. Department of the Interior, Washington 25, D. C., pursuant to the specifications, the envelope to be marked plainly "Bid on New Mexico Royalty Oil, not to be opened before noon, d.s.t., September 16, 1947." Dated August 14, 1947. Oscar L. Chapman, Under Secretary of the Interior.

Serna, in Survey 290, originally completed through perforations at 4,004-10 ft., reworked and completed through perforations at 3,915-28 ft., top pay 3,905 ft., for IP: 35 bbl. oil per day through a 3/16-in. choke, gas-oil ratio 686 cu. ft., TP 480 psi., CP 800 psi., gravity 46.9°, 5 per cent water.

SOUTHWEST TEXAS WILDCAT FAILURES

Duval County: Frank J. Gravis 1 National Oil Co.-Schallert, 6 mi. N of Benavides on E flank of Palangana salt dome, in SK&K Sur. 241, dry, TD 5,003 ft.

R. H. Hawn 1 Atlee Parr, Sec. 40, Subd. of Parr Ranch, in San Andres Grant, 8 mi. SE of Benavides, TD 5,465 ft.

H. H. Howell 1-B Singer Est., in G. Cumberland Sur. 4, on SE flank of Palangana salt dome, 5 mi. N of Benavides, dry, TD 6,521 ft.

San Patricio County: Continental Oil Co. 1 Mrs. Caroline McIlvaine, Sec. 31, A. W. Templeton Sur., 7½ mi. W of Sinton, dry, TD 6,593 ft.

Starr County: C. G. Glasscock 1 F. Sanchez, in Geronimo Saenz Porcion 75, 5 mi. W of El Sauz, dry, TD 1,220 ft.

Webb County: Dulaney Oil Co. 3 Ochoa et al, in Isidro Gutierrez Grant, Sur. 592, 6 mi. S of Mirando City, dry, TD 1,816 ft.

W. C. McBride, Inc. & Houser & Campbell 1 S. Benavides, in Mary H. Pennell Sur. 698, 6 mi. NE of Bruni, dry, TD 2,582 ft.

TEXAS GULF COAST

Bee and Jackson Tests Look Promising

HOUSTON.—Dirks & Wood 1 J. H. Coward, wildcat, 1 mile northwest of La Para, in Live Oak County, near the Bee County line, recovered 20 ft. of gas-cut mud and developed 216 psi. working pressure on drill-stem test at 4,243-48 ft. in 15 minutes, bottom-hole pressure 300/600 psi. On drill-stem test, open 15 minutes, at 4,249-54 ft., it recovered 30 ft. of oily mud, developed 250 psi. working pressure with bottom-hole pressure 310 psi. open and 1,600 psi. closed. Total depth is 4,502 ft. Operators are preparing to set casing for a production test.

Teten & Pratt are preparing to run a production test in their 1 Rudolph Yaussi, wildcat test approximately 1 mile southwest of the Cordele field, in Jackson County. Casing was set on bottom at total depth of 3,000 ft. after drill-stem test at 2,788-2,800 ft. in the Oligocene recovered 800-ft. water cushion plus 60 ft. of clean black oil and 290 ft. of sand and oil mixture. Working pressure on the test reached a maximum of 23 psi., and bottom-hole pressure was 650 psi. open and 1,200 psi. shut. Tool was open 10 minutes through ¼-in. chokes top and bottom. This well is located in John M. White Survey.

Stanolind Oil & Gas Co. 3 C. J. Anderson, wildcat exploration in the Lucky field area of Matagorda County, more than a mile east of production, in Elisha Hall Survey, is preparing to make another test after showing gas, condensate and salt water on an initial try. Total depth is 10,800 ft., with 5-in. liner cemented in the hole and perforated from 10,160-168 ft., for the test.

Union Producing Co. 1 Jomer J. Moore, wildcat test in the North Houston area of Harris County, in John E. Durkee Survey, is reported cleaning into pits for completion as a gas well. Total depth of the hole is 8,500 ft. and 7-in. casing is cemented to 7,920 ft.

Atlantic Refining Co. 1 A. M. Albrecht, located ⅝ mile west of oil production at Boyce field in Goliad County, recovered 1½ gal. of amber condensate on a 5-minute drill-stem test at 4,249-63 ft., bottom-hole pressure 1,625 psi. open and 1,750 closed. Test at 4,270-83 ft., through ¼-in. chokes, developed 44 psi. working pressure in 3 minutes, but packer failed, and recovery was 360 ft. of oil-cut mud, 100 ft. of 48°-gravity oil, no water, bottom-hole pressure 1,050 psi. flowing. This well is located in the B. P. Tumlinson Survey.

There were 29 new locations reported this week 6 of which are wildcats, 1 each in Brazoria, Colorado, Jefferson, Live Oak, Matagorda, and Refugio counties. Seven wildcats were dry, 1 each in Calhoun, Fort Bend, Harris, Jasper, Karnes, Orange, and Wharton counties.

TEXAS GULF COAST WILDCAT FAILURES

Calhoun County: Quintana Pet. Corp. 1 F. L. Frerichs, Lot 7, Block K, Welhausen & Driscoll Subd. of Taylor Ranch in Manuel Venitez and John Polland surveys, 3½ mi. SW of Sheriff field, 2 mi. NW of Green Lake field discovery, dry, TD 10,185 ft.

Fort Bend County: J. W. Frazier & O. J. Marten 1 Estate of S. E. Lee et al, Isaac McGary Sur., ½ mi. SW of Kendleton townsite, dry, TD 8,212 ft.

Harris County: Texas Co. 1 Geo. H. Feser et al, Pierce Junction area, in Jas. F. Cruger Sur., 4 mi. NE of Almeda, dry, TD 8,418 ft.

Jasper County: Gulf Oil Corp. 1-D W. A. Smith, Buna Prospect, in J. B. Smyth Sur., and D. B. Koger Sur., dry, TD 10,870 ft.

Karnes County: Edwin B. Cox & J. L. Hamon 1 J. R. Murphy, in Thomas Harmon Sur., 1½ mi. E of Burnell-Wilcox field, and 8 mi. E of Green, dry, TD 3,852 ft.

Orange County: Shell 1 Southern Pet. Co., North Port Neches area, in Susan Frazier Sur., dry, TD 9,080 ft.

Wharton County: Houston Oil Field Serv-

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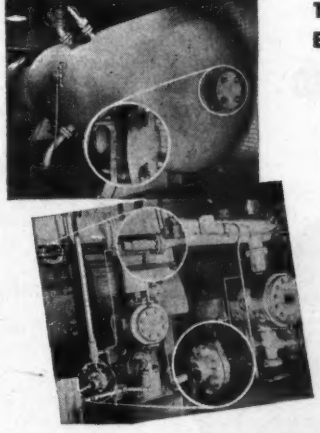

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ice Co. 1 Myatt & Beck, in North Louise area, in Jas. Mitchell Sur., 9 mi. N of Louise townsite, 1 mi. W of No. Louise gas production. Dry, TD 5,529 ft.

EASTERN TEXAS

New Pettit Field for Anderson County

DALLAS.—Sanders & Murchison 1 Broadway, Pettit limestone discovery 3 miles east and slightly south of Blackfoot, in Anderson County, was finaled for 406 bbl. of 44.1°-gravity oil in 24 hours, flowing through ¼-in. tubing choke. Flowing tubing pressure was 610 psi., casing pressure was 1,710 psi, and gas-oil ratio was 562 cu. ft. Pay was from 71 perforations between 9,736-40 and 9,750-58½ ft.

New oil production seemed assured at a test midway between Reilly Springs and the Coke field (Paluxy and lower Glen Rose) of Wood County, when Delta Drilling Co. 1 W. H. Coker recovered 725 ft. of 20-25°-gravity oil on a drill-stem test in the sub-Clarksville at 4,119-4,210 ft. Further testing and completion potential were to be made after setting casing.

In Freestone County, southwest of Stony Point Church, The Texas Co. 1 Ester L. Irwin et al was showing for a distillate discovery after reccovering gas-cut mud in drill-stem tests. From perforations at 8,132-46 ft., packer at 8,104 ft., and using ¼-in. chokes, the water cushion hit the surface in 7 minutes; the well cleaned itself in 11 minutes and flowed gas with a slight spray of mud and distillate. No gage was made of the fluid recovered but it was reported to be 30 per cent distillate, 60 per cent water and 10 per cent mud. Flowing tubing pressure was 1,300 psi., with shut-in bottom-hole pressure at 3,225 psi. The well has been estimated good for 2,000,000 cu. ft. of gas a day, through ¼-in. choke. Operators acidized the Pettit zone through perforations, with 3,000 gal., and were flowing the well into pits to clean. Another Freestone exploration test, Humble Oil & Refining Co. 1 R. P. McWatters, 1½ miles south of the town of Freestone, was waiting on cement at 5,178 ft. in limestone.

In Harrison County, Stanolind Oil & Gas Co. 1 Slaughter set 5½-in. casing at 6,897 ft., after plugging back from 10,374 ft. Two Pettit zones showing wet gas, and two levels in the Travis Peak were to be tested. This well was originally scheduled to drill to the Smackover, but was still in the Cotton Valley when it plugged back.

EAST TEXAS WILDCAT FAILURES

Harison County: Southern Producing Co., Inc. 1 W. H. Cargill, P. Dougherty Sur., 3 mi. E Scottsville, dry, TD 6,696 ft., top Massive, by samples, 4,907 ft.

Hill County: Dal Woods 1 J. E. Estes, George W. Walker Sur., 2 mi. SW Penelope, dry, TD 1,250 ft., Austin 448-785 ft., sand 1,080 ft., by samples.

CANADIAN FIELDS

Leduc Field Growing At Rapid Rate

CHATHAM.—In the Leduc field, Imperial 6, LSD 1, 22-50-26w4, finished in Devonian limestone at5,359 ft., has initial production of 129 bbl. with ½-in. choke. Imperial 7, LSD 4, 15-50-26w4, is testing at 5,397 ft.

Imperial 8, LSD 7, 26-50-26w4, offsetting No. 3 producer a quarter mile to the south, showed heavy natural gas flow in the D-3 zone. Drill-stem test at 5,275-95 ft. started at the rate of 3,700,000 cu. ft. a day increasing to 8,000,000 cu. ft. Hole was deepened and test at 5,299-5,310 ft. yielded 97 bbl. in slightly less than an hour, or flush of close to 2,400 bbl. a day, with considerable gas. This is the eighth successive producer completed by Imperial. Imperial has five other wells drilling.

Globe-Leduc West 2, LSD 9, 34-50-26w4, finished at 5,284 ft., and has been completed in the D-3 zone of the Devonian, with flush of 80 bbl. an hour. Globe-Leduc West 1, LSD 6, 19-50-26w4, is below 4,637 ft., after drill-stem test at 4,601 ft. showed a 660-ft. rise of mud with some gas. It is logging deeper than Imperial 2 producer.

Leduc Consolidated 1, LSD 10, 25-50-26w4, which blew in with a measured flow of 15,000,000 cu. ft. of gas, has established control and is deepening. Okalta Leduc 1, LSD 13, 7-50-25w4, outpost test to the east, is standing at 6,110 ft. opening electrolog survey. B. A. Prycz 1, LSD 12, 25-50-26w4, deepening into the lower formations, is below 5,726 ft. Six other independent tests are drilling.

Central Plains.—There is considerable drilling activity in potential Devonian areas of the Central Alberta plans outlying the Leduc field. Most important test is Millet-Leduc 16-6, LSD 16, 6-48-24w4, south and east of Leduc, below 4,760 ft. after cores and drill-stem tests showed traces of gas and oil. It entered the Devonian No. 1 horizon at 4,640 ft. McColl-Frontenac Wizard Lake 14-14, LSD 14, 14-48-27w4, south of the Leduc field, is coring below 6,166 ft. McColl-Frontenac Bigstone Creek 1-20, LSD 1, 20-46-26w4, has been abandoned at 6,218 ft. McColl-Frontenac has spudded a new test at Telfordville, 18 miles west of Leduc.

Imperial Oil is starting two tests in the plains area north of the Leduc field. Imperial-Legal 1, LSD 8, 18-58-24w4, is about 50 miles northeast and Imperial-Woodbend

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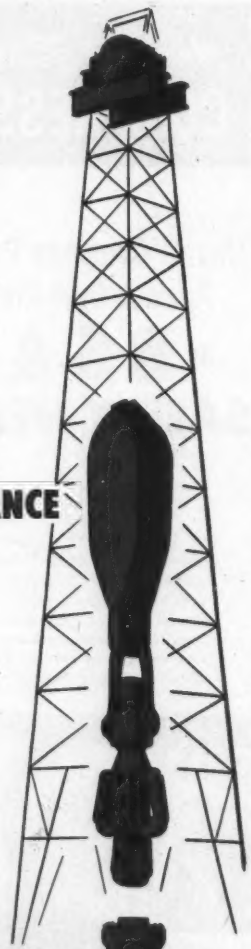

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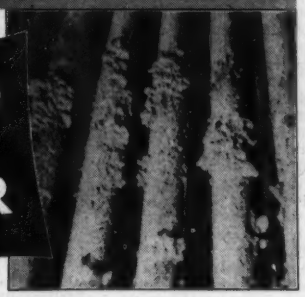

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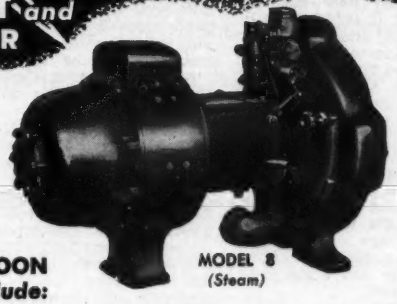

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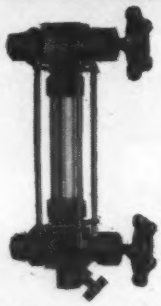

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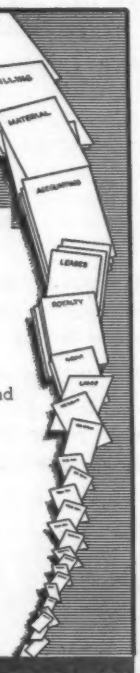

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1, LSD 5, 15-51-26w4, is between the field and the Canadian Gulf Stony Plain test.

Gulf Oil operations.—In the southern foothills close to the Montana boundary, Canadian Gulf-Pincher Creek 1, LSD 15, 24-3-29w4, is in shale below 8,794 ft. Some 10 miles northwest of Leduc production, Canadian Gulf-Stony Plain 1, LSD 14, 9-52-26w4, has spudded and is below 656 ft. In the Stettler district, Canadian Gulf-M. Jerard has location in LSD 16, 34-37-20w4.

British Columbia.—Under a new statute of the British Columbia legislature, the provisions placing all oil leases on a reserve basis, and requiring stakers to set aside equal reserve areas for the government have been rescinded. New law provides for a single reserve district in the Lone Mountain area north of Pouce Coupe; and throughout the rest of the province no government reserve is required. Relaxation of the restriction is expected to encourage oil development, particularly in the Peace River block, where good oil seepages have been encountered.

Manitoba.—The Manitoba department of mines and resources reports that United States interests are exploring for oil in the western part of the province, 12 reservations having been taken up since the new regulations were announced early this year.

SOUTH LOUISIANA

Venice Pool Gets New Pay

NEW ORLEANS.—A new oil sand for the Venice pool in Plaquemines Parish has been opened by Tide Water Associated Oil Co. 36 Buras Levee District, Section 28-21s-20e. Drilled to a total depth of 12,568 ft., top of new sand was encountered at 12,552 ft., and well was completed through open hole at 12,552-568 ft., for an initial production of 313 bbl. of oil per day through a 7/64-in. choke, gas-oil ratio 836 cu. ft., tubing pressure 1,800 psi., gravity 32.3°, with 0.1 per cent water in the flow.

Magnolia Petroleum Co. 1 Vincent Estate, in the Mud Lake area of Cameron Parish, 18-14s-10w, opened new gas-condensate sand. Total depth is 10,950 ft., with perforations at 9,539-51 ft. and 9,957-10,047 ft. Initial production flowed 39 bbl. of condensate per day and 2,791,000 cu. ft. of gas per day through a 12/64-in. choke. Gas-condensate ratio 71,500. Tubing pressure 3,675 psi., gravity 44.1°, with no water in the flow.

Shell Oil Co., Inc. 1 Opendweyer-Alcux Cypress, wildcat off the north flank of the St. Gabriel dome in Iberville Parish has made an initial gage on gas lift equipment. Total depth is 11,000 ft., with perforations at 9,770-84 ft. Gage reported was 171 bbl. daily through a 30/64-in. choke showing 71 per cent water and a gas ratio of 5,310 cu. ft. Gravity 41°.

Superior Oil Co. of California 2 State-LLE, Unit 12, 24-21s-16e, Four Isle Dome in Terrebonne Parish, is coring in prospective oil sands below the 14,000-ft. level. Operators ran log to 14,028 ft., which indicated possible oil sands at the bottom. The 7-in. pipe was cemented to 14,028 ft., and operators are back in with core barrel after drilling out plug and bottoming the hole in sand at 14,032 ft.

In the Ship Shoal area off Terrebonne Parish shore, Magnolia Petroleum Co. is building platforms, etc., for the drilling of both its wildcat explorations. The 1 Block 72 on State Lease 766, 8 miles south of Coon Point field is a 13,500-ft. project and the 1 South Pelto Block, on State Lease 791, Block 11, is a shallow test 10 miles south of Lake Pelto field.

Nineteen miles south of the Vermilion Parish shore line, out in the Gulf of Mexico, Superior Oil of California started drilling operations in the 1-A Gulf of Mexico, State Lease 884, Block 71, Vermilion area. Present total depth is 2,530 ft. Log was run and 13⅜-in. surface pipe is being cemented in the hole. This is a 12,000-ft. project, with nearest production being 22 miles to the north in Fresh Water Bayou field.

Twelve new locations including one wildcat in Calcasieu Parish were reported this week. Two new sands were opened, one each in Cameron and Plaquemines parishes, and one dry wildcat was completed in Acadia Parish. Ten oil wells in proven areas were completed.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Cameron Parish: New gas-condensate sand, Mud Lake—Magnolia Pet. Co. 1 Vincent Estate, 18-14s-10w, TD 10,950 ft., perf. 9,539-51 ft. and 9,957-10,047 ft., IP: 39 bbl. condensate per day and 2,791,000 cu. ft. gas per day through 12/64-in. choke, gas-condensate ratio 71,500, TP 3,675 psi., gravity 44.1°, no water.

Plaquemines Parish: New oil sand, Venice pool—Tide Water Assoc. Oil Co. 36 Buras Levee District, 28-21s-20e, top sand 12,552 ft., TD 12,568 ft., completed through open hole at 12,552-568 ft., IP: 313 bbl. oil per day through 7/64-in. choke, gas-oil ratio 836, TP 1,800 psi., gravity 32.3°, 0.1 per cent water.

SOUTH LOUISIANA WILDCAT FAILURES

Acadia Parish: Nelson Bunker Hunt Tr. Est. 1 American Rice Milling Co., NW NW 23-9s-1w, 3 mi. NE of Egan field production, dry, TD 10,942 ft., top Marginulina 9,715 ft., Camerina sand 10,173 ft., Hayes sand 10,025 ft., slight show of oil in top, bottom part showed salt water.

MISSISSIPPI

Jones County Test Pumping Oil

JACKSON.—At Sandersville, Jones County, Union Sulphur Co. 1 Earline Parker, 31-10n-10w, has resumed pumping tests after acidizing perforations with 1,000 gal. of mud acid. Well is pumping 18 to 20 bbl. of heavy black oil per day with no salt water. Union Sulphur 1 A. E. Fall Estate, 8-9n-10w, has perforated the City Bank sand zone 5,412-5,420 ft., but has shown only slight show of oil on several continuous swabbing tests.

At Ovett, Jones County, Gulf Refining Co. 1 L. L. Majors, 29-6n-11w, recovered only 2 in. of salt on core from 13,157-13,167 ft., operators planning to drill ahead for approximately 75 ft., take one more 10-ft. core, then plug back to bottom of 5½-in. casing to start testing for completion.

H. E. Williams 1 State, wildcat in Jones County, 16-7n-11w, is drilling ahead below 7,500 ft. after recovering salt water sand in cores from 7,277-7,299 ft.

J. R. Frankel 1 A. Eisner Estate, 24-11n-4w, in Yazoo County, recovered heavy asphaltic oil shows in sidewall cores of sands in basal Tuscaloosa. Operators are now drilling below 7,227 ft. in Comanche.

Permits for three new wildcat tests were granted this week. Gulf Refining Co. 1 R. M. Gambrell, located in 8-9n-13w, Jones County; C. H. Murphy, Jr.-Sun Oil Co. 2 State, in 16-13n-6w, Sharkey County, and Humble Oil & Refining Co. 1 P. H. Enochs et al, 18-3n-12e, in Walthall County.

Three wildcats were completed dry this week, 1 each in Humphreys, Lamar and Sharkey counties.

MISSISSIPPI WILDCAT FAILURES

Humphreys County: The Texas Co. 1-A Mrs. Laura A. Lightcap, 21-15n-3w, dry, TD 6,522 ft. Top Wilcox 1,605 ft., Midway 3,174 ft., Selma 3,965 ft.

Lamar County: Rogers Lacy 1 John T. Rayborn, NW SE 35-2n-16w, dry, TD 8,327 ft.

Sharkey County: C. H. Murphy, Jr.-Sun Oil Co. 1 State, 16-13n-6w, dry, TD 4,050 ft.

FLORIDA WILDCAT FAILURES

Suwanee County: Sun Oil Co. 1 J. H. Tillis, SE SW 28-2s-15e, dry, TD 3,571 ft.

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Walton County: Hunt Oil Co. 1 Gehew Linton, NE NE 30-3n-17w, dry, TD 6,503 ft.

APPALACHIAN FIELD

New Wildcat Start For Eastern W. Va.

PITTSBURGH. — In Springfield district, Monroe County, West Virginia, Godfrey L. Cabot, Inc., has made a location for another wildcat in the eastern part of the state with No. 1,252 Genevieve Lorew. This is the third test in the county and neither of the other two are completed. On the Alderson Quad, it is located 5.4 miles south 37 degrees 35 minutes, and 2.5 miles west 80 degrees 40 minutes. It starts at an elevation of 1,732.4 ft.

In Logan district, Logan County, Columbian Carbon Co. completed 962 Island Creek Coal Co., reported last week as showing oil, and it is good for 380 bbl. Penn Grade oil, with the Big lime topped at 2,021 ft., oil 2,157-63 ft., elevation 1,071 ft. There have been several heavy Big lime oil shows on this tract.

In Big Sandy district, Kanawha County, Falling Rock Producing Co. is drilling through the sand in No. 3-A fee with the top of the Oriskany at 5,085 ft. and a gage of 1,142,000 cu. ft. of gas 6 ft. in the sand. In Cabin Creek district, West Virginia Gas Corp. is drilling an Oriskany wildcat on Eastern Gas & Fuel Associates tract which, from a surface elevation of 785 ft., topped the Corniferous lime at 5,523 ft.

New locations in West Virginia totaled 19 and in Boone, Braxton, Jackson, Lewis, Lincoln, McDowell, Monroe, Putnam, Ritchie, Wood and Wyoming counties.

In Greenfield Township, Erie County, northwest Pennsylvania, Appalachian Development Corp. is hauling in material for a wildcat on Lloyd Jones farm which, on the North East Quadrangle, is located 1,900 ft. east of 79 degrees 50 minutes, and 12,125 ft. north of 42 degrees .05 minutes, with an elevation of 1,409 ft.

In Wayne Township, Erie County, Pennsylvania Gas Co. struck about 60 gal. of black water an hour at 4,180 ft. in the wildcat on John Kalika farm and continues to drill ahead. This is in the Silurian.

New locations in southwest Pennsylvania totaled nine in Armstrong, Indiana, and Westmoreland counties.

WEST VIRGINIA SUCCESSFUL WILDCAT
Jackson County, Ripley district: United Fuel Gas Co. 6,199 E. F. Puckett, 1,726-000 cu. ft. gas, elevation 751 ft., Corniferous lime 4,753 ft., Oriskany 4,851-90 ft., gas 4,858-63 ft., shot 4,848-90 ft., total depth 4,890 ft.

WEST VIRGINIA WILDCAT FAILURE
Kanawha County, Poco district: Leatherwood Oil & Gas Co. 1 Lucinda J. Jackson, dry, Injun sand, TD 1,768 ft.

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CALIFORNIA

Sunray Finds New Horizons In Recently Opened Field

LOS ANGELES.—Sunray Oil Corp. has definitely added a new producing zone in their recently discovered field in the Orcutt area of Santa Barbara County by completion during the past week of the 2 Los Flores, 4-8n-33w. The well was completed in the chert zone at a total depth of 5,527 ft. for a flow of 100 bbl. of oil and 645,000 cu. ft. of gas daily. The crude tested 31° gravity and contained a water cut of only 0.5 per cent.

First production in the area was opened approximately 2 months ago by the Sunray 1 Los Flores, which was completed in the Miocene sand at a depth of 4,805-30 ft. In addition to the two zones now producing in the field, it is believed that production can also be established in the Miocene-Pliocene contact zone at approximately 4,400-4,500 ft. and in a shallow sand encountered in the drilling of the two wells. The contact zone produced at the rate of approximately 200 bbl. daily in the 2 Los Flores during a formation test made in the course of drilling. Sunray currently is engaged in drilling at 940 ft. in the 1-A Los Flores, which will be a shallow test, and have staked location for the 3 Los Flores which will be drilled in 4-8n-33w.

Seaboard Oil Co. last week officially completed its discovery well in the Lawndale area of Los Angeles County, the 1 Johnson, 17-3s-14w. Initial production was 598 bbl. of 15°-gravity crude daily through a 14/64-in. choke. Flow was accompanied by 2,000,000 cu. ft. of gas. Total depth of the well is 8,026 ft., and 2½-in. tubing is hung at 7,893 ft.

Latest reported production gage of the R. E. Havenstrite 15 Lincoln, 16-4n-17w, deep zone discovery in the Del Valle field, is 125 bbl. of 32°-gravity oil and 52,000 cu. ft. gas daily through a 12/64-in. choke. Production is through several perforated intervals between 10,140 ft. and plugged back depth of 11,865 ft. The well was originally carried down to 12,868 ft.

Arizona.—Hogue-Arizona Petroleum, Inc., has started drilling operations at its 1 McConnell, a new wildcat venture for the state. Location of the well is in 28-18-20, about 4 miles west of Holbrook in Navajo County. It is scheduled to go all the way to the basement in the event nothing of interest is uncovered higher.

Washington.—Shell Oil Co., Inc., recently has acquired acreage in the Black Diamond area approximately 10 miles north of Enumclaw, Wash. These properties have

been leased from the Pacific Coast Coal Co., Northern Pacific Railroad Co., and Northwest Improvement Co. Drilling operations at the first exploratory venture on the acreage, which will be Shell's first drilling venture in the Pacific Northwest, are expected to start within the next few days.

CALIFORNIA SUCCESSFUL WILDCAT

Ventura County, Simi area: Union Oil Co. 5 C. D. L. B., 32-3n-18w, pumped 84 bbl. per day, 60 per cent cut, elev. 975 ft., TD 1,775 ft.

CALIFORNIA WILDCAT FAILURES

Butte County, Willows area: General Petroleum Corp. 2 Llano Seco, 28-10n-1w, dry, elev. 100 ft., Basalt 1,237 ft., TD 3,050 ft.

Kern County, Weedpatch area: General Petroleum Corp. 27-22 Kernsumner, 22-30s-28e, dry in hard sand, elev. 365 ft., base Chanac 6,345 ft., top Carbonaceous 6,806 ft., TD 6,806 ft.

San Luis Obispo County, Cuyama area: Oil Well Abandonment Co. 1 Cuyama, 25-11n-28w, dry, elev. 1,714 ft., TD 4,795 ft.

Yolo County, Winters area: Shell Oil Co., Inc. 1 Heinz Unit, 20-8n-1e, dry, elev. 110 ft., Hooper 4,245 ft., McCune 5,104 ft., Unit 1-1 sand 5,209 ft., TD 5,300 ft.

MICHIGAN

Kimball Lake Gets Five Good Wells

SAGINAW.—Another 6,500 bbl. in initial daily potential was reported from five more completions in the prolific Kimball Lake oil field in Newaygo County in the past week. Potential of the wells ranged from 300 to 2,400 bbl. a day. Kimball Lake completions also included one dry hole, and in Home Township of Newaygo County a wildcat operation ended up also a dry hole.

Michigan field activities resulted in a total of 24 completions. Oil producers numbered eight, including two small wells in Bay County, another in Montcalm County. Six of the seven gas wells are in the Winterfield area of Clare County, the seventh in Osceola. Of the nine dry holes, seven were wildcats, including one drilled to 5,015 ft. in Roscommon County. Total initial potential of the seven gas wells was 60 million cu. ft.

New locations equalled the number of completions. They were listed for nine counties—three in Allegan, four in Bay, four in Clare, five in Newaygo, three in Oceana, two in Osceola, one each in Ottawa, Kent and Montclam.

MICHIGAN WILDCAT FAILURES

Allegan County, Casco Township: Socony-Vacuum Oil Co., Inc. 1 Barden, NE NE NW 8-1n-16w, dry in Traverse limestone, TD 1,195 ft.

Heath Township: Wayne C. Prather 1 Louis Pol, NW NW SE 16-3n-14w, dry in Traverse limestone, TD 1,475 ft.

Salem Township: Leonard S. Sleep 1 Charles A. Lane, SE SW SW 32-4n-13w, dry in Traverse limestone, TD 1,627 ft.

Gratiot County, Arcada Township: Daily Crude Oil Co. 1 Harry Sailor, NW NE SW 31-11n-3w, dry in Dundee, TD 3,287 ft.

Isabella County, Nottawa Township: H. E. Bell 1 F. A. Focht, NW NE NW 6-15n-5w, dry in Dundee, TD 3,839 ft.

Newaygo County, Home Township: Rex Oil & Gas Co. 1 J. Blake, C-32-16n-12w, dry in Traverse limestone, TD 2,634 ft.

Roscommon County, Higgins Township: Sun Oil Co. 1 Fred M. Douglass Foundation, S-SW NW 24-23n-2w, dry in Detroit River, TD 5,015 ft.

LA.-ARK.

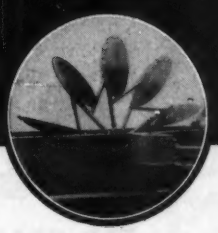
Wesson May Get Mile Extension

EL DORADO.—A 1-mile southwest extension to the Wesson field of Ouachita County was in prospect at T. W. Lee and R. W. Burnett 1 E. H. Morgan, NE SW SW 27-15s-19w, which logged 38 ft. of saturated Hogg sand. On last report, operators were to run casing to bottom at 3,142 ft. and make production tests. The Hogg formation is one of many producing zones in the Wesson field.

In the old McDonald area of what is now the Pace City field, Johnson Drilling Co. and A. B. Turner reported a flow of 9 bbl. of oil an hour through ¼-in. tubing choke at their 1 C. M. Wilson, in the SE NE SW 25-15s-18w. Production is from the Glen Rose sand around 2,800 ft. Location of the new producer is on the discovery 40 acres of the McDonald field, where that field's wells were abandoned several years ago.

In Lafayette County, Barnsdall Oil Co. & G. H. Vaughn 1 Bodcaw Lumber Co., 8-18s-23w, was drilling below 5,881 ft. Base of the massive anhydrite was 4,723 ft., and top on the Travis Peak was 5,713 ft., by samples. In Ashley County, northeast of Wilmot, Chicago Corp. 1 Morris, 31-18s-4w, was drilling below 3,533 ft.

North Louisiana exploratory operations were little changed from the previous week. In the Ringgold area of Bienville Parish, The Texas Co. 1 W. A. Givens, 25-16n-9w, was drilling below 6,004 ft. in shale and limestone. Cores at 5,785-95 ft. showed hard, oolitic limestone, with slight porosity and slight gas odor, but a 1-hour drill-



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stem test showed no pressure and recovered 40 ft. of mud. Union Producing and Pure Oil Co. 1 Frazier, 14-14n-6w, tested at 7,800-7,884 ft., total depth. In 20 minutes there was no pressure and the recovery was 10 ft. of mud with no shows. Operators were reaming out to drill ahead.

NORTH LOUISIANA WILDCAT FAILURES

Franklin Parish: J. A. Harper 1 Owen & Drexler estate, NW NE NW 6-16n-9e, dry, TD 3,667 ft., Wilcox 1,752 ft., Tuscaloosa 3,272 ft., Massive sand 3,585 ft., Paluxy 3,651 ft., elevation 96 ft., slight gas odor 3,356-60 ft.

Madison Parish: C. H. Murphy & Sun 1 O'Neal, 8-17n-10e, dry, TD 3,409 ft.

Richland Parish: George B. Franklin 3 fee, S½ NW SW 27-18n-8e, dry, TD 3,379 ft.

Winn Parish: Stanolind Oil & Gas Co. 1 Tremont Lumber, NW SW 30-12n-1w, dry in Travis Peak at 12,569 ft., no tops reported, elevation 221 ft.

ARKANSAS WILDCAT FAILURES

Ashley County: McAlester Fuel Co. 1-F Crossett Lumber Co., NE NE 28-16s-7w, dry, TD 1,798 ft.

Calhoun County: E. C. Johnston 2 Freeman-Smith, NE SE 31-14s-15w, dry, TD 2,725 ft.

Desha County: Carter Oil Co. 1 L. Isom, SE SW 33-9s-1w, dry, TD 4,725 ft., Wilcox 1,821 ft., Midway 2,966 ft., Tokio 4,330 ft., Eagle Mills 4,650 ft., elevation 158 ft.

Jefferson County: J. A. Stassi & Stratton 1 W. Stratton, NE SW SW 25-6s-9w, dry, TD 4,344 ft., Midway 2,980 ft., Nacatoch 3,760 ft., base annona 4,239 ft., elevation 192 ft.

Little River County: Frank & George Frankel 1 Weatherspoon, SE NW SE 21-12s-30w, dry, TD 3,432 ft.

N. CENTRAL TEXAS

Two Mississippi Prospects For Throckmorton County

WICHITA FALLS.—Possibilities of a good flowing producer in the O'Dell waterflood area of southern Throckmorton County were seen when Woodley Petroleum Co. 2 O'Dell, Block 696, TE&L Survey, recovered oil on a drill-stem test of the Mississippi limestone between 4,532 and 4,590 ft. First tests, after topping the limestone at 4,532 ft. and drilling to 4,660 ft., brought gas to the surface in 23 minutes, and then flowed sulfur water. The hole was plugged back to 4,575 ft. and a second test, open 32 minutes, put gas to the surface in 2 minutes and a spray of oil in 26 minutes. Total recovery was 30 ft. of heavily oil-cut drilling mud and 1,800 ft. of clean oil. Operators drilled cement out to 4,590 ft. and opened the tool again. Gas flowed in 12 minutes, and salt water in 22 minutes. No report was made as to whether or not the well flowed oil, but total recovery from the test was 3,472 ft. of oil and 115 ft. of salt water. Operators then plugged back to 4,575 ft. in an effort to shut off the water and were preparing to set casing for completion.

Southeast of Throckmorton, J. H. Snowden et al 1 Howsley, Block 300, BBB&C Survey, was making completion tests as a Mississippi limestone discovery. A 3-hour test, through ½-in. choke, gaged 101 bbl. of oil. A second test, through ¼-in. choke, produced 131 bbl. of oil in 6 hours, at which time the well was shut in for completion potential. Top on the Mississippi was 4,664 ft., with casing set to 4,674 ft., and total depth at 4,719 ft. Operators have staked location for the 2 Howsley 2,800 ft. from south and 2,750 ft. from east lines of the same block. It was reported the 2 Howsley will test the Caddo, which had shown for commercial production in the first test.

NORTH TEXAS SUCCESSFUL WILDCAT

Young County: R. C. Lipscomb 1 W. R. Foster, Sec. 342, TE&L Sur., 3 mi. SE Padgitt, flowed 112 bbl. oil in 16 hours through 6/64-in. choke, top Mississippi 4,679 ft., pay 4,679-91 ft., TD, acidized with 500 gal.

NORTH TEXAS WILDCAT FAILURES

Archer County: C. E. Beavers 1 J. H. Turbeville, Blk. 99, Jefferson School Land, 2 mi. SE Anarene, dry, TD 1,130 ft. in shale, Gunsight 1,053 ft., sand with show of oil 1,066-68 ft.

Jack L. Story 1 J. Conrady, Blk. 4, Clark & Plumb Subd., 3 mi. NW Windthorst, dry, TD 1,208 ft., Gunsight 1,143 ft., sand with show of oil 1,194 ft.

Baylor County: R. E. Alexander 1 C. O. Brown, Sec. 49, Blk. 15, H&TC Sur., 3 mi. S Bomarton, dry, TD 2,513 ft. in shale.

Cooke County: Anderson Drilling Co. 1 J. H. Wolfe, P. Lewis Sur., 1 mi. W Muenster, dry, TD 2,000 ft. in shale.

Harvey Drilling Co. 1 Sara D. Wilson. M. L. Webster Sur., A-1,118, 1 mi. E Gainesville, dry, TD 2,280 ft. in shale.

Wichita County: W. H. Hammon & Warren Oil Corp. 1 Wayne Roberson, Blk. 16, Cherokee School Land Sur., 3½ mi. SE Wichita Falls, dry, TD 5,922 ft. in shale.

WEST CENTRAL TEXAS SUCCESSFUL WILDCATS

Jones County: Delhi Oil Corp. 1 A. Newmann, Sec. 52, Blk. 18, T&P Sur., 3 mi. NW Noodle, pumped 40 bbl. 38°-gravity oil a day, upper Hope limestone perforated at 2,928-34 ft., TD 2,934 ft.

Shackelford County: Jack L. Story 1 G. R. Davis, Sec. 48, Blk. 14, T&P Sur., 14 mi. NE Albany, pumped 24 bbl. oil a day, oil sand 1,555-61 ft., TD.

WEST CENTRAL TEXAS WILDCAT FAILURES

Eastland County: Algord Oil Co. 1 O. P. Wheeler, Lot 2, Holcomb & Davis Subd., 12 mi. SW Eastland, dry, TD

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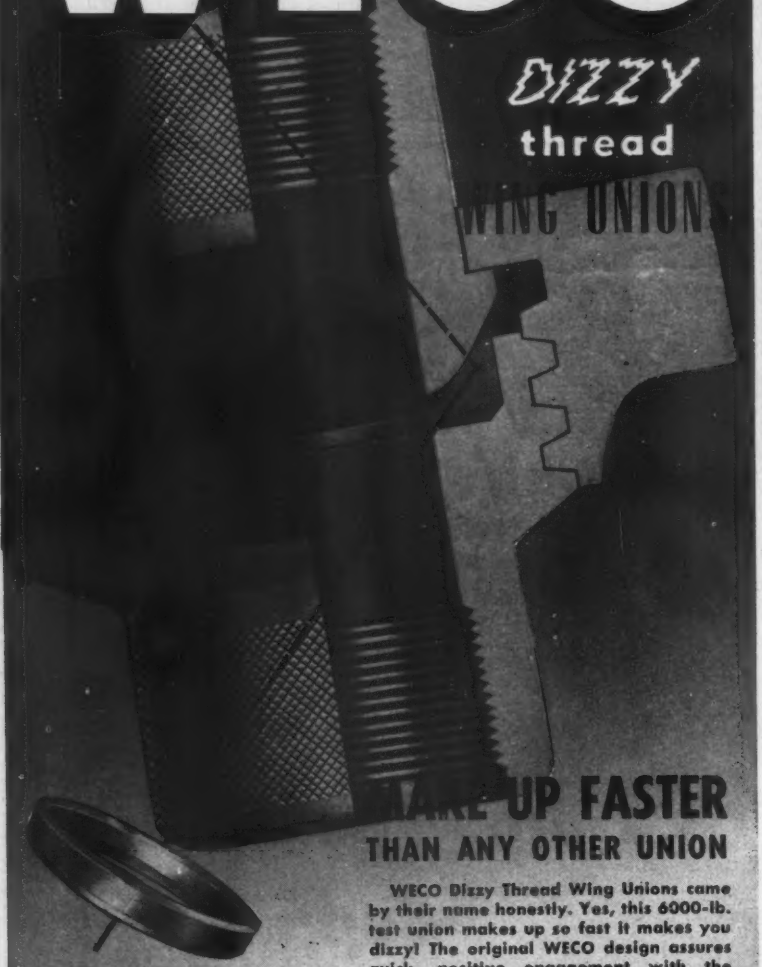

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3,812 ft., Caddo 2,627 ft., Barnett shale 3,518 ft., Mississippi 3,642 ft., Ellenburger 3,652 ft.

Jones County: Clark & Cowden 1 Roy Nunnelly, Sec. 40, Orphan Asylum Lands, 8½ mi. SE Anson, dry, TD 2,400 ft., Dotham 1,640 ft., Saddle Creek 1,950 ft., Bluff Creek 1,975 ft.

Taylor County: S. C. Herring 1 J. R. Sanders, Sec. 54, Blk. 16, T&P Sur., 4 mi. NW Abilene, dry, TD 2,520 ft., Flippen 2,071 ft., Saddle Creek 2,210 ft.

Seaboard Oil Co. 1 Parmelly, Blk.10, Guadalupe School Land Sur., 3 mi. NW View, dry, TD 3,804 ft., Dotham 2,428 ft., Flippen 2,816 ft., Reef limestone 3,766 ft.

Throckmorton County: Fred M. Manning, Inc. 2 R. A. Brown Cattle Co., Sec. 942, TE&L Sur., 5 mi. NW Woodson, dry, TD 1,445 ft.

ROCKY MOUNTAIN

Elk Basin Region Prospects Widen

DENVER.—The Elk Basin area again is in the limelight with shows of oil and gas in Seaboard Oil Co. and Resolute Oil Co. 53-33 Northern Pacific, NW SW NE 33-58n-100w, Sand Coulee district, between the Elk Basin and Badger Creek fields. It was started as a 9,000-ft. test to the Tensleep, but is showing up favorably in the Frontier. Top of that formation is tentatively placed at 5,505 ft.

A drill-stem test at 5,918-48 ft. had a recovery at the rate of 200,000 cu. ft. of gas and 2½ bbl. of oil per hour from the second Frontier. Conditions resemble to a large extent those which resulted in Sinclair-Wyoming Oil Co. brining in a 4,940-bbl. well in the Madison on the northwest side of Elk Basin; Continental Oil Co. opening a new pool in the Tensleep in South Elk Basin; and favorable showings in upper horizons in Carter Oil Co. test on southwest side.

The Sand Coulee well is only 4 miles west of 95-M Unit, the second well to the Madison in Elk Basin proper which is nearing completion, and 4½ miles south of Sinclair's Wilkins well. Location is not far from the major line of north-south faulting which separates Elk Basin from the Clark's Fork structure. The Sinclair well is east of this fault and west of faults which separate it from Elk Basin proper.

South Elk Basin.—Continental Oil Co. 8 Ida Goodstein, NE SW NW 20-57n-99w, South Elk Basin, Park County, Wyoming, an outpost on the northwest, was completed in the Tensleep at a total depth of 7,140 ft., swabbing 21 bbl. of 27.3°-gravity oil per hour, no water, and is given a potential of 500 bbl. per day. Top of Tensleep was at 7,116 ft., and 7-in. was set at 7,713 ft.

This well is located 1½ miles south of Carter Oil Co. 8 Johnson-Watson in NE SE SW 8-57n-99w, which is testing a fault block at the southeastern edge of Elk Basin proper. The Carter well, which is outside the Elk Basin unit, showed for 3,700,000 cu. ft. of gas in 15 minutes in a drill-stem test at 3,401-26 ft., probably in the Frontier.

Elk Basin Madison test.—Stanolind Oil & Gas Co. 95 Unit, NE NW SE 31-58-99, on Carter Oil Co. lease, second test to the Madison 2 miles south of the Madison discovery in Elk Basin, in a 20-hour swabbing test averaged 28 bbl. of oil per hour, 26.9° gravity. It is bottomed in shale at 5,941 ft. after cutting 908 ft. of water-free Madison lime. A squeeze job was then run to shut off leak in liner at 4,224-4,315 ft. Top of Madison was at 5,029 ft., and 5-in. liner was cemented at 4,272-5,725 ft.

Ant Hills development.—The Ant Hills structure in Niobrara County, Wyoming, 12 miles northeast of the Lance Creek field, is coming in for attention as a result of a recent extension 4 miles to the

north. The discovery well, Buck Creek Oil Co. 1 Delahoyde, NE NE 25-37n-63w, was completed in 1928 for 178 bbl. daily of 35°-gravity crude from the Muddy sand at 3,945-52 ft. The surface geology indicated a small oval structure with 150 ft. of closure defining 400 acres. Offsets failed to indicate anything of importance, and production of the discovery declined rapidly.

Ten years later tools were moved in and the discovery was deepened to 6,925 ft. It tested all horizons down into the Madison with little more than scums of oil in the Leo sand, the Lance Creek producing horizon. Last April the Arrow Oil Co., which operates a refinery at Centralia, Ill., moved in and cleaned out the old well and recompleted it for 65 bbl. per day.

The operator then went 4 miles north and drilled 1 Wessenberger, SW NE SW 1-37n-63w, completing it for 104 bbl. per day on the pump, in the Muddy at 4,818-26 ft. The Ames Management Co. is moving in two rotaries and a cable-tool rig. Locations for the rotary tests are 1 Government, C NW SW 1-37-62, and 2 Wessenberger, C SE NW 1-37-63. The cable-tool rig will be used to test shows in upper sands near the discovery which were passed up in the original drilling. The geology discloses bisecting faults between the discovery and the extension to the north.

WILDCAT FAILURES IN COLORADO

East Powder Wash, Moffatt County: Cities Service Oil Co. and Transcal Pet. Corp. 1 Government, SE SE NW 27-12n-96w, TD 6,000 ft., P. & A. Water in Wasatch sands. Top Fort Union 4,770 ft.

SUCCESSFUL WILDCAT COMPLETION IN MONTANA

Pacific Western Oil Corp. 1 Donovan, SE SE SW 25-35n-4w, TD 1,934 ft., Ellis-Madison contact 1,922 ft., est. 150 bbl. per day on pump. Opens new pool on west side Kevin-Sunburst field.

WILDCAT FAILURE IN MONTANA

Mosser, Yellowstone County: Anton Koeber 1 Metzger, SW SW NW 8-3s-25e, P. & A. No shows. Dakota, 870; Mosser, 987; Ellis, 1,515; Madison, 2,465 ft. Loc. 4 miles northeast of some shallow production.

ILLINOIS

Inman District May Get New Pay

MATTOON.—In the Inman district, 3 miles northeast of Ridgway, R. B. Martin-Puritan Drilling Co. 1 Straub, NE NE NE 21-8s-9e, has set pipe and is swabbing to test the productivity of the Tar Springs sand at 2,185-95 ft., and 2,210-17 ft. A previous drill stem test recovered 300 ft. of oil and 90 ft. of oil-cut mud, with no water. If successful this will be the first Tar Springs pay for this area.

There seems to be some pickup in activity since Labor Day, with 42 new operations being reported, including 8 wildcats. This compares with 34 completions last week, including 7 wildcats. The new wildcat reports included one each in Edgar, Edwards, Fayette, Jefferson, Madison, Shelby, Wabash and Wayne counties.

ILLINOIS SUCCESSFUL WILDCATS

Shelby County: Paul Doran 1 Manning, NE NW SW 14-11n-4e, TD 2,084 ft., PBTD 1,880 ft., shot 1,860-80 ft., pumped 70 bbl.

ILLINOIS WILDCAT FAILURES

Clark County: G. McNary #2 McNary, SW NW NW 1-10n-14w, dry, TD 561 ft.

Clinton County: L. G. Torkelson 1 Weidle, NE SW NE 3-2n-1w, dry, TD 1,457 ft.

Hamilton County: A. J. Slagter 1 Williams, SW SE NW 1-7s-7e, dry, TD 3,281 ft.

Jefferson County: Calvert & Willis 1 Pfeiffer, NW NW SE 20-1s-3e, dry, TD 2,703 ft.

Richland County: Ashland Oil & Refining Co. 1 Gillespie, SW NE NE 16-2n-9e, dry, TD 3,250 ft.

OHIO, KENTUCKY

Salt Creek Gas Extended East

COLUMBUS.—Clinton gas production has moved east into Rich Hill Township, Muskingum County, from Salt Creek. Wasson Co. 1 Harkness-Kingston, Section 31, gaged 1,300,000 cu. ft. natural. Clinton sand was found at 4,620-52 ft. and the pay at 4,636-40 ft.

John Morrow et al 1 Frederick Mautz, Section 19, Brush Creek Township, Muskingum County, gaged 900,000 cu. ft. from the Clinton, 4,097-4,114 ft., when first drilled in, but blew down to 500,000 cu. ft. Drilling was continued and a good showing of oil was found in the Medina sand at 4,178-84 ft. Initial production after shot has not yet been reported.

A second large Clinton gas well has been completed on the Jesse Ketcham tract, Section 22, Bearfield Township, Perry County. Sand at 3,898-3,927 ft. gaged 2,694,000 cu. ft. natural. The well was completed by George W. Sharp et al.

The Pure Oil 5 Edward Hickey, Section 13, Hanover Township, Licking County, found the Clinton at 2,857-96 ft. with a good showing of oil. After a shot the well made 129 bbl. in 24 hours. One-half mile northwest, Allen Willey et al 1 E. S. Randolph, Section 13, made 75 bbl. in the first 24 hours after shot. Clinton was found at 2,948-83 ft.

Cambridge and Lancaster fields each reported five completions this week, followed by Ashland and Brush Creek with three each. Perry County, reflecting increasing activity, reported six new locations.

EASTERN KENTUCKY ACTIVITIES

ASHLAND.—No completions were of record during the week, with the Labor Day holiday, but several new locations were noted, chiefly Kentucky-West Virginia Gas Co. with No. 871, Joseph Hall, Knott; No. 879, J. S. Cline, Pike; 5770, Henderson Hall, Floyd and 5773, J. S. Franklin, Knott.

Investigation of the wildcat, Pure Oil Co. et al 1 McKnight, 7-H-67, Laurel County, revealed that the new strike may not prove as productive as at first believed. The well was producing 33 bbl. at the outset, and a new depth is being sought to determine definitely the possibilities. Estimates now indicate that the well may not go over 20 bbl., normal flow.

WESTERN KENTUCKY

OWENSBORO.—In the new Slaughters pool, the discovery George S. Engle 1 J. A. Dixon 2-L-24 was formally completed for 390 bbl. natural flow from the Tar Springs sand at 2,546-80 ft. Meantime same operator's No. 2 is reported flowing 17 bbl. per hour natural from the pay at 2,532-63 ft., No. 3 is about ready, and No. 4 cut a fault at 2,450 ft., and had only a slight show in the Tar Springs. There are six other active operations in the pool.

WESTERN KENTUCKY SUCCESSFUL WILDCAT

Webster County: Slaughters Pool Discovery —George S. Engle 1 J. A. Dixon, 2-L-24, 1¼ miles west of Slaughters, flowed 400 bbl. daily 40° gravity oil from Tar Springs sand 2,546-80 ft., TD 2,580 ft. Elevation 481 ft.

WESTERN KENTUCKY WILDCAT FAILURE

Union County: Sam Malis 1 Buckman, 21-P-20, dry TD 2,651 ft., St. Genevieve 2,525 ft.

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INDIANA

EVANSVILLE.—This week marked the formal completion of the discovery well of the Evansville pool, 1½ miles north of the Evansville city limits, for 185 bbl. per day natural in Pennsylvanian sand at 875-96 ft. However, there are now four other producers, one dry hole, and 10 active operations.

INDIANA SUCCESSFUL WILDCAT

Vanderburgh County: New pool opener, (Evansville pool)—Calvert-Willis et al 1 Egli, NE SW SW 2-6s-11w, TD 896 ft., initial production 185 bbl. per day natural from Pennsylvanian sand at 875-96 ft.

Oklahoma Fields

(Continued from page 143)

2s-4w, pumped 10 bbl. of 29°-gravity oil from 2,664-2,928 ft.; Hoxbar 1,250 ft., Springer 2,950 ft., Mississippian Caney 3,570 ft., TD 3,749 ft.

OKLAHOMA WILDCAT FAILURES

Beckham County: R. O. Brown 1 Battle, NW NE NE 24-8n-27w, dry, TD 2,002 ft., lime 865-85 ft., lime and shale 1,440-50 ft., dolomite 1,787 ft.

Cotton County: E. W. Stephens 1 Kirkpatrick, SE NW NW 5-4s-9w, dry, TD 2,158 ft., sand 480-85 ft. with slight odor of oil, Megargel lime 2,032-38 ft.

Barbre et al 1 Kurtz, NW NW SE 25-2s-12w, dry, TD 2,008 ft., sand 958-70 ft., sand and conglomerate 1,280-1,305 ft., sand and shale 1,524-38 ft. and 1,801-34 ft.

Kingery Drilling & Van Patton 1 Starr, SE SE NW 8-3s-11w, dry, TD 1,928 ft., sands 1,598-1,630 ft., 1,722-25 ft., and 1,841-68 ft.

J. P. Owens 1 Mun-Na-Quan-Nah, NW NW SE 4-4s-11w, dry, TD 2,126 ft., sand 1,470-82 ft. and 1,500-10 ft., broken sand and lime 1,755-1,815 ft., sand 1,990-95 ft., lime and shale 2,099-2,126 ft.

E. C. Harlin, Jr. 1 Warren, NW NW SE 2-5s-13w, dry, TD 2,350 ft., Megargle lime 1,725 ft., Caney 2,332 ft.

Garfield County: North American Oil Corp. 1 Pommett, C NE SW 34-21n-6w, dry, TD 7,312 ft., Basal Pennsylvanian-Mississippian 6,351 ft., Woodford 6,843 ft., Sylvan 6,913 ft., Viola 7,025 ft., dense 7,095 ft., Wilcox 7,173 ft., second Wilcox 7,290 ft.

Continental et al 1 Lash, NE NE SE 17-21n-7w, dry, TD 7,877 ft., Herrington 2,177 ft., Foraker 2,948 ft., Pawhuska 3,592 ft., Dewey 4,696 ft., Layton 5,546-5,619 ft., Big lime-Oswego 6,098 ft., Cherokee 6,367 ft., Mississippi lime 6,750 ft., Woodford 7,365 ft., Hunton 7,432 ft., Sylvan 7,438 ft., Viola 7,563 ft., dense 7,650 ft., dolomite 7,686 ft., Wilcox 7,736 ft., Marshall 7,743 ft., second dolomite 7,773 ft., second Wilcox 7,779 ft.

Jackson County: W. H. Spradling 1 Masters, SW SE NW 11-2n-21w, dry, TD 2,505 ft., no tops reported.

Kay County: E. H. Langston et al 1 Burr, NW NW SE 19-25n-1e, dry, TD 4,338 ft., Tonkawa sand 2,579 ft., Layton 3,210 ft., chat 4,137 ft., Mississippi lime 4,338 ft.

Murray County: Southard & Spencer 1 Murphy-Carr, SE NW NW 28-2n-3e, dry, TD 2,420 ft., Basal Pennsylvanian 1,300 ft., McLish 1,420 ft., Basal McLish 1,795 ft., Oil Creek 1,920 ft., Basal Oil Creek 2,150 ft., Arbuckle 2,410 ft.

Noble County: Hall-Miller Drilling 1 Loeb, SE SE SE 10-23n-1w, dry, TD 5,103 ft., Layton 3,539 ft., Oswego 4,100 ft., Bartlesville 4,458 ft., Mississippi lime 4,634 ft., Woodford 4,900 ft., Viola 5,005 ft., Wilcox 5,049 ft., second Wilcox 5,097 ft.

Okfuskee County: Mid-Continent 1 Diehle, NW NW NE 33-13n-7e, dry, TD 4,250 ft., Hogshooter 1,510 ft., Layton 1,620 ft., Checkerboard 1,870 ft., Cleveland 1,960 ft., Oswego 2,801 ft., Prue 2,885-91 ft., Verdigris 3,026 ft., Skinner 3,031 ft., Red Fork 3,184 ft., Bartlesville 3,394 ft., brown lime 3,527 ft., Dutcher 3,630 ft., sand 3,693 ft., Caney 3,705 ft., Mississippi 3,850 ft., Woodford 4,143 ft., Hunton 4,171 ft., Sylvan 4,228 ft.

Oklahoma County: Double R Drilling 1 Hudson, NW NW NW 31-14n-1e, dry, TD 5,840 ft., Oswego 4,944 ft., Prue 5,070-5,119 ft., Woodford 5,413 ft., Misener 5,480-83 ft., Hunton 5,483 ft., Sylvan 5,517 ft., Wilcox 5,715-38 ft., second Wilcox 5,812 ft.

Payne County: Fleet & Roadhouse 1 State, SE SE NW 16-18n-3e, dry, TD 4,110 ft., Hogshooter 2,930 ft., Checkerboard 3,242 ft., Prue 3,530 ft., Oswego 3,578 ft., Verdigris 3,760 ft., Bartlesville 3,869 ft.

Pottawatomie County: Easton Oil 1 Briggs, NW SE NW 24-6n-3e, dry, TD 2,872 ft., Pawhuska 1,418 ft., Hoover 1,710 ft., Belle City 2,237 ft., Hogshooter 2,520 ft., Layton 2,642-62 ft., Checkerboard 2,832 ft.

J. F. Smith 1 Stice, NW NW NW 17-8n-2e, dry, TD 5,763 ft., Pawhuska 2,220 ft., Belle City lime 3,630 ft., Hogshooter 4,005 ft., Checkerboard 4,242 ft., Cleveland 4,430 ft., Calvin 4,870 ft., Senora sand 5,040 ft., Bartlesville 5,250-5,300 ft., Lower Bartlesville 5,320 ft., Woodford 5,345 ft., Hunton 5,373 ft., Chimney Hill 5,640 ft., Sylvan 5,730 ft.

Mid-Continent 1 Anderson Unit, SW SW SW 5-11n-5em, dry, TD 5,030 ft., Avant 2,000 ft., Belle City 2,250 ft., Hogshooter 2,535 ft., Layton 2,575 ft., Checkerboard 2,875 ft., conglomerate 3,130 ft., Oswego 3,618 ft., Prue 3,623 ft., Earlsboro 3,957-4,031 ft., brown lime 4,202 ft., Mayes 4,516 ft., Hunton 4,762 ft., Sylvan 4,805 ft., Viola 4,925 ft., dense 4,946 ft., dolomite 4,964 ft., Wilcox 4,984 ft., second Wilcox 4,992 ft.

Seminole County: Easton & Duncan 1 Wallace, NE NE NE 21-8n-7e, dry, TD 4,517 ft., Senora lime 2,353 ft., brown lime 3,125 ft., Booch 3,203-42 ft., sand 3,261-70 ft., Union Valley 3,286 ft., second Cromwell 3,326 ft., Wilcox 4,410-65 ft., second Wilcox 4,510-17 ft.

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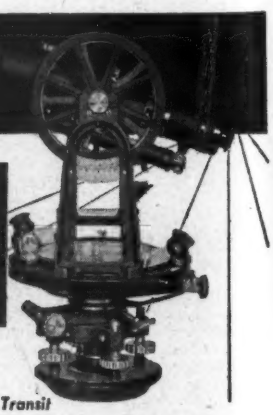

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Drilling Contractors

Charters Issued Two Oklahoma Contractors

Two Oklahoma drilling companies have been issued charters by the Oklahoma secretary of state in recent weeks.

Frisbie & Yancey Drilling Co., Tulsa, has $50,000 capital stock and was incorporated by W. S. Frisbie and S. M. Rutherford, Tulsa, and .A T. Yancey, Eunice. N. M. **W. L. Clingman Drilling Co., Inc.,** Guthrie, has been granted Oklahoma charter with $40,000 capital stock. Incorporators are Walter L. and Ernest Clingman, Oklahoma City, and Ferd A. Holman, Guthrie.

C. H. Withers, Lloydminster, has contract for H-C 11-29, LSD 11, 29-50-3w4, some 24 miles due west of Lloydminster.

Arrow Drilling Co., Tulsa, is under contract for Schmitz & Warner 1 Page, a wildcat in 5-8n-9w, 2 miles north of Robeline, Natchitoches Parish, North Louisiana.

Drilling Contractors, Ltd., Calgary, Alta., have started work on a joint wildcat test for Anglo-Canadian, Home Oil and Calgary & Edmonton Corp. to be known as Camrose 1, in LSD 9, 28-46-21w4. The area is south and east of Leduc field. The same company is starting Imperial 15, LSD 7, 21-50-26w4, in Leduc field, which gives it a total of seven rigs in operation.

Penrod Drilling Co., Tulsa, has contracts for two wildcats for Hunt Oil Co. in North Louisiana. The tests are the 1 Louisiana Delta Lumber, 6-4n-5e, 8 miles northwest of Argo, Catahoula Parish, and 1 Kincaid, C SE NW 19-12n-7e, Franklin Parish.

E. F. McIntire has received contract for a wildcat, the E. L. Bourret 1 U. S. and Olivia Gilbert 1, NE SW NW 10-14n-14w, Newaygo County, Michigan.

Williams - Copeland Drilling Co., Tulsa, is starting a 5,100-ft. test in Noble County, Oklahoma, its 1 Brorsen, SW SW SW 31-22n-1e.

Commonwealth Drilling Co., of Calgary, Alta., has contracts for three tests in a drilling program launched by Husky Refining Co. to test potential extensions of Lloydminster field. The first test, H-C 5-10, LSD 5, 10-

One of Trinity Drilling Co.'s crews on the Continental Oil Co. B-41-1 Kloah, TXL field, Ector County, Texas. The men are: C. C. Simmons; L. B. Culpepper; J. B. Baruden, driller; Bill Shelton, and Bill Black

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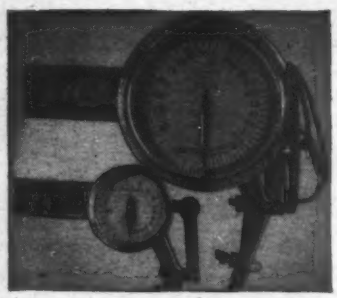

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48-4w4, near Vanesti and about midway between Lloydminster and Wainright fields, has spudded. Commonwealth also has contracts for H-C 11-11, LSD 11, 11-48-2w4, some 16 miles southwest of Lloydminster; and H-C 3-14, LSD 3, 14-50-3w4, 4 miles south of Kitscoty.

Calvert & Willis, Almey, Ill., have set surface pipe on J. J. Lynn 1 J. J. Frichtl, 163 ft. from south and 660 ft. from west lines, C NE SE 27-7n-10e, Jasper County, Illinois.

Glenn Peel, Hoisington, Kan., is completing Barnett Drilling Co. 1 Montgomery, a wildcat, NW NE NE 7-8-23, Graham County, Kansas. The test hit the Arbuckle at 3,954 ft.

McCullough Drilling Co. has received contract for Ashland Oil & Refining Co. 45 David Cooper Heirs, 330 ft. from south and 990 ft. from east lines, SE NE 24-3s-14w, Gibson County, Indiana.

Jack Grace, Wichita Falls, is moving in for Continental Oil Co. 1 Kate Emmert, William Anglin Survey A-2, Wichita County, North Texas.

E. F. Moran, Inc., Evansville, has been contracted by Rush Creek Oil Co., Inc., to drill its 1 J E. Shoultz, 330 ft. from north and west lines, NW NW SE 12-5s-14w, Posey County, Indiana.

Virginia Drilling Co., Wichita, is drilling ahead on its 2 Hertner "B," SW NE SE 17-20-11, ¼ mile from Silica pool production, Barton County, Kansas.

C. H. Holland is preparing to drill Kirk D. Holland 1 Bertha Peak, 330 ft. from south and 1,250 ft. from east lines, SE NE 29-1n-9w, Pike County, Indiana.

Regent Drilling Co., Calgary, Alta., has contract for an important wildcat test for British American Oil Co. and Omnitrans Corp. to be drilled on a 10,221-acre lease block in the Hand Hills area south of Leduc held for several years by Shell Oil of Canada, which conducted seismographic survey. The well, B. A.-Hand Hills 1, LSD 7, 14-30-17w4, will be drilled to approximately 5,500 ft. to test formations to and including the Devonian limestone.

Smith-Horton Drilling Co., Tulsa, has staked location for a test north of production in Bowlegs sector, Seminole County, Oklahoma. The wildcat is scheduled for 3,400 ft. and is 1 Mayhue, SE NE NW 12-8n-6e.

Tilley Drilling Co., Wewoka, Okla., has completed one producer and is starting another well for Garr-Wooley Co. in the new South Davenport area of Lincoln County, Oklahoma. Garr-Wooley 1 Deans, NE NW SW 15-14n-5e, hit the pay at 3,362-3,410 ft. and flowed 23 bbl. of oil per hour through a ¼-in. choke. Tilley is starting work on 2 Craig, NW SW NW 22-14n-5e.

Harlan Park is the contractor for R. Hal Compton 1 Frank A. Kleeman, 990 ft. from south and 165 ft. from east lines, NW 21-6s-3w, Perry County, Indiana.

A. E. Spielberg has been contracted by R. A. T. Wright and Neil Wagenaar to drill 1 Ralph Schooley, NW NW NE 11-15n-12w, Newaygo County, Michigan.

J. D. Ferrel, Great Bend, has brought in a producer for Aladdin Petroleum Co., the 1 Woolf, SE SW NE 7-28-1w, Sedgwick County, Kansas. The well flowed 60 bbl. oil per hour through 1-in. choke.

Hall-Miller Drilling Co., Oklahoma City, has brought in an extension to Jones field in East Central Texas, its 1 Geisler, NE NE SE 26-13n-1e, Jones County, Texas.

Olson Drilling Co., Midland, Tex., and E. M. Wahlenmaier, San Angelo, Tex., were moving in to spud their 1 Arthur Stuart, a 5,800-ft. wildcat in central Sutton County, West Texas. Location is some 18 miles southeast

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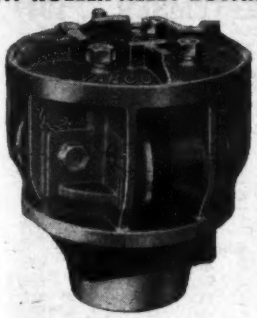

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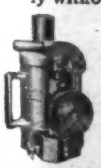

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of Sonora, in Section 68, Block 7, TW&NG Survey. It is 3 miles east of Shell Oil Co., Inc., 1 Duke Wilson, which completed for 9,000,000 cu. ft. of gas a day in the Strawn section of the Pennsylvanian at 4,220-45 ft., early in 1946.

E. J. Henderson will drill Frederick B. Cline 2 Homer Humke, 990 ft. from north and 330 ft. from east lines, SE NW 30-19n-4e, Hamilton County, Indiana.

American Drilling Co., Saginaw, Mich., will drill a test for J. E. Bauer, the 1 Wesley Bruce, SE SE SW 16-20n-5e, Arenac County, Michigan.

Rocky Mountain Drilling Co., Los Angeles, has been contracted by Richfield Oil Corp. for its wildcat, 1 Del Cielo, Montalvo area, Ventura County, California.

Norwood Drilling Co., Wichita Falls, is rigging up for 6666 Oil Co. 2 S. B. Burnett, Section 12, Block 5, S. Lazarus Survey, Bateman field, Jack County, Texas.

Leonard Drilling Co., Mt. Pleasant, Mich., is the contractor for a wildcat, Leonard Oil, Inc., & Ward Oil Co. 1 George Packard, NE NE SW 14-19n-6e, Arenac County, Michigan.

Westlund & Johnson, Midland, Tex., has the contract for L. G. Yarbrough & Son and W. A. Phillips 1 W. T. Coble, Tract 41, League 68, Hardeman CSL Survey, 8 miles southwest of Levelland, Hockley County, West Texas.

Warren & Bradshaw Drilling Co., Tulsa, were the contractors on Stanolind Oil & Gas Co. 1 Reinhart, a wildcat in central Oklahoma County which hit pay at 6,307-27 ft. for 120 bbl. of oil in 1½ hours on drill-stem test. The test is in C SW SW 30-13n-2w, 1 mile southwest of Witcher gas-distillate field, Oklahoma.

W. H. Black Drilling Co., Midland, Tex., has contracts for three Humble Oil & Refining Co. tests in West Texas. In east Crockett County, P. L. Childress estate will go to 8,150 ft. to test the Ellenburger. Location is in Section 5, Block CD, D&SE Survey, and approximately 2 miles south and ¾ mile east of Humble's 1 Mitcham, recent Ellenburger discovery. In southwest Ector County, Humble's 2 Yarborough & Allen will test the Ellenburger, in Section 18, Block B-14, PSL Survey. It is one location southwest from the company's 1 Yarborough & Allen, Ellenburger discovery at 10,490-600 ft. The third test is the 1 F. M. Weaver estate, a 5,500-ft. wildcat in central Dawson County, on the northwest side of the Lamesa townsite. Humble has a spread of some 6,000 acres adjacent to the drill-site.

They call me "HANDY ANDY"

I can test pipe and fittings, remove cores, and develop pressures up to 6,000 psi for any and all types of testing. I weigh approximately 68 lbs. on a solid base, but if you don't want to lug me around, then order me with wheels.

BAKER hydraulic HAND PUMP

ASK THE BAKER MAN

PUMPS for PETROLEUM PRODUCTS

Write for Bulletin 102— Pumps for the Petroleum Industry

It will tell you why

BLACKMER ROTARIES

are *SELF-ADJUSTING FOR WEAR*

GATHERING PUMPS
REFINERY PUMPS
BULK STATION AND TRUCK PUMPS
HAND PUMPS
SUCTION LINE STRAINERS

Capacities to 750 GPM.

BLACKMER PUMP COMPANY
1940 Century Ave., Grand Rapids 9, Mich.

STATISTICS and

WEEKLY WELL COMPLETIONS . . . WEEK ENDED SEPTEMBER 6, 1947

	Total of all wells							Wildcat completions and discoveries									
						Cum.							Cumulative total, 1947				
	Comp.	Oil	Gas	Dry	Footage	1947	1946	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	42	21	0	*21	55,860	1,088	1,079	0	0	0	0	0	3	0	0	2	5
Pennsylvania	64	33	7	†24	103,804	1,984	2,717	0	0	0	0	0	0	0	3	1	4
West Virginia	17	3	11	3	47,188	571	493	0	0	1	1	2	0	0	14	7	21
Ohio	24	7	10	‡7	62,026	888	816	0	0	0	0	0	0	0	3	32	35
Indiana	14	5	2	7	16,102	433	249	1	0	0	0	1	20	0	0	33	53
Kentucky	18	6	1	11	32,642	459	333	1	0	0	1	2	8	0	0	32	40
Illinois	34	19	0	15	82,124	1,363	1,506	1	0	0	6	7	48	0	1	237	286
Michigan	24	8	7	9	57,732	585	561	0	0	0	7	7	6	0	10	152	168
Kansas	53	29	6	18	177,492	1,750	1,352	2	0	0	11	13	29	0	11	237	277
Neb., Mo., Iowa	0	0	0	0	0	4	15	0	0	0	0	0	0	0	0	4	4
Oklahoma	106	47	10	‡49	344,117	2,819	1,809	7	1	1	19	28	72	5	12	472	561
Texas	192	108	6	76	777,884	6,148	5,490	6	1	0	32	39	198	44	61	926	1,229
North Central (Dist. 7-B & 9)	70	32	2	36	183,566	1,997	1,973	3	0	0	11	14	62	0	8	316	386
West (Dist. 7-C & 8)	44	37	0	7	174,067	1,480	1,176	0	0	0	4	4	21	0	3	112	136
Panhandle (Dist. 10)	8	5	1	2	23,507	295	226	0	0	0	1	1	1	0	1	8	10
Eastern (Dist. 5 & 6)	6	1	2	3	32,454	348	507	0	0	0	2	2	5	1	4	76	86
Gulf Coast (Dist. 3)	34	20	0	14	228,458	1,069	1,200	0	0	0	7	7	51	32	26	193	302
Southwest (Dist. 1, 2 & 4)	30	13	3	14	135,832	959	408	3	1	0	7	11	58	11	19	221	309
Louisiana	40	27	1	12	210,519	988	918	1	1	0	5	7	27	17	9	136	189
Northern	23	15	1	7	56,704	556	508	0	0	0	4	4	3	1	3	81	88
Southern	17	12	0	5	153,815	432	410	1	1	0	1	3	24	16	6	55	101
Arkansas	15	5	1	9	54,026	193	120	0	0	0	5	5	1	0	0	39	40
Mississippi	9	4	0	5	75,351	332	164	0	0	0	3	3	0	0	1	63	64
Southeastern States	2	0	0	2	10,074	40	29	0	0	0	2	2	0	0	0	35	35
Montana	7	4	1	2	14,028	183	214	1	0	0	1	2	4	0	5	17	26
Wyoming	2	2	0	0	9,806	153	120	0	0	0	0	0	9	0	2	24	35
Colorado-Utah	4	3	0	1	25,077	135	97	0	0	0	1	1	2	0	1	34	37
New Mexico	11	7	1	3	47,966	356	260	0	0	0	2	2	4	0	1	26	31
California	35	28	1	6	143,068	1,316	1,150	1	0	0	4	5	35	0	6	188	229
Total United States	713	366	67	280	2,346,886	21,788	19,492	21	3	2	100	126	466	66	140	2,697	3,369
Total previous week	736	391	94	251	2,510,369	21,075	18,896	10	7	4	86	107	445	63	138	2,597	3,243
Total Sept. 7, 1946	596	337	66	193	1,940,922			16	0	0	62	78	369	28	83	2,292	2,772

Service wells included: *21, †23, ‡2.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULES

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.*	Oklahoma, Kansas	Gulf Coast Tex.†	West Tex.‡
18-18.9	$1.60	....	....	....
19-19.9	1.65	....	....	....
20-20.9	1.69	$1.55	....	$1.42
21-21.9	1.73	1.57	....	1.44
22-22.9	1.77	1.59	....	1.46
23-23.9	1.80	1.61	....	1.48
24-24.9	1.84	1.63	$1.86	1.50
25-25.9	1.88	1.65	1.88	1.52
26-26.9	1.91	1.67	1.90	1.54
27-27.9	1.95	1.69	1.92	1.56
28-28.9	1.99	1.71	1.94	1.58
29-29.9	2.02	1.73	1.96	1.60
30-30.9	2.06	1.75	1.98	1.62
31-31.9	....	1.77	2.00	1.64
32-32.9	....	1.79	2.02	1.66
33-33.9	....	1.81	2.04	1.68
34-34.9	....	1.83	2.06	1.70
35-35.9	....	1.85	2.08	1.72
36-36.9	....	1.87	2.10	1.74
37-37.9	....	1.89	2.12	1.76
38-38.9	....	1.91	2.14	1.78
39-39.9	....	1.93	2.16	1.80
40 and above	....	1.95	2.18	1.82

*Standard Oil Co. of Calif. posting. †For crude from Daboval, El Campo, and Sandy Point. ‡Includes Lea County, New Mexico.

A.P.I. REFINERY REPORT, WEEK ENDED AUGUST 30

District—	Crude runs, daily avg.	Production (Thousands of barrels) Gasoline†	Kerosine	Gas & dist. oil	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines Gasoline*	Kerosine	Gas & dist. oil	Residual
East Coast	795	2,341	211	1,117	1,553	19,928	8,526	16,707	9,901
Appalachian:									
District 1	109	300	46	92	102	2,165	339	600	341
District 2	65	221	10	54	122	865	192	157	186
Ind., Ill., Ky.	842	2,959	294	910	1,077	14,686	2,801	7,094	5,019
Okla., Kans., Mo.	435	1,547	154	495	509	6,697	1,133	3,024	1,380
Inland Texas	230	969	67	128	438	2,762	512	535	907
Texas Gulf Coast	1,227	3,980	647	1,657	1,788	13,755	3,407	9,275	6,570
La. Gulf Coast	388	1,191	306	464	543	4,610	2,192	2,590	1,769
N. La. & Ark.	67	169	46	64	104	1,596	421	333	184
Rocky Mountain:									
New Mexico	13	41	4	11	20	87	15	21	33
Other Rocky Mt.	143	434	11	146	237	1,872	159	859	753
California	895	2,601	114	781	2,469	15,082	1,026	13,613	28,199
August 30, 1947	5,209	16,753	1,910	5,919	8,962	84,105	20,723	54,808	55,242
August 23, 1947	5,217	16,539	2,091	5,892	8,674	83,915	19,981	‡53,018	‡54,688
August 31, 1946	4,901	15,405	1,849	5,374	8,357	86,813	19,348	53,858	53,037

*Finished and unfinished. †At refineries including natural blended. ‡Revised.

Bureau of Mines crude-oil stocks 228,281,000 bbl. as of August 30—up 639,000 bbl. One year ago 227,132,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.			
East Texas	$1.95	Pecos County, Texas (Yates)	1.65
Kettleman Hills, California*	2.14	Bradford, Pennsylvania	4.30
Beauregard Parish	1.90	Eastern Ill. and Western Ind.†	2.07
Illinois Basin	2.07	Tomball, Texas Gulf Coast	2.10

*37°-37.9°. †35° and above.

TRENDS

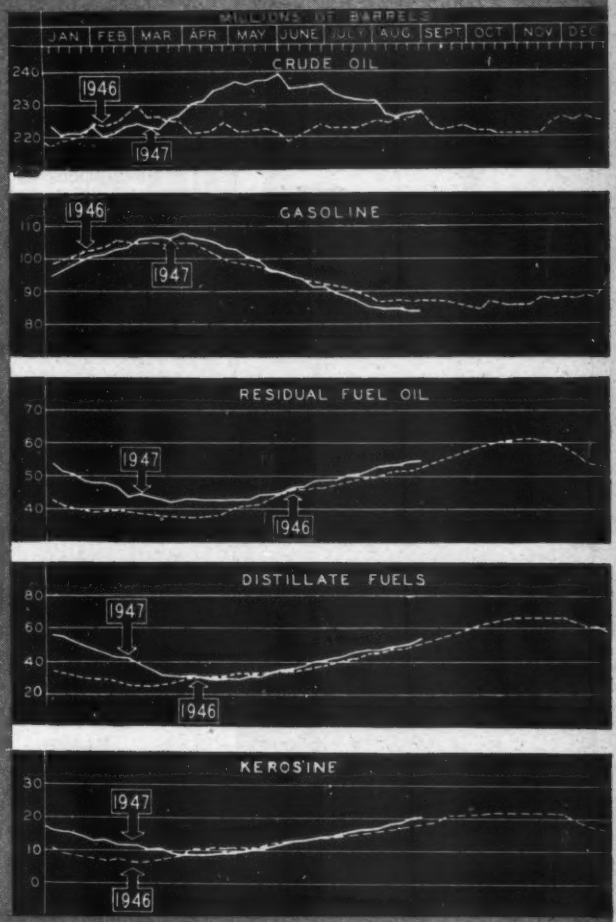
DAILY AVERAGE PRODUCTION FOR WEEK

	Sept. 6 crude oil	B. of M. Aug. demand	Aug. 30 crude oil
Alabama	1,100	1,200	1,050
Arkansas	81,950	81,000	81,650
California	925,300	920,000	927,900
Colorado	44,240	43,000	47,110
Eastern	62,000	65,400	64,100
Florida	1,100	800	1,100
Illinois	178,900	200,000	171,300
Indiana	17,500	18,000	17,000
Kansas	284,750	305,000	303,750
Kentucky	25,800	27,000	25,100
Louisiana	439,525	437,000	437,400
North Louisiana	107,300	.....	107,350
South Louisiana	332,225	.....	330,050
Michigan	43,490	45,000	41,795
Mississippi	99,250	96,000	100,055
Montana	23,880	24,000	23,780
Nebraska	550	600	550
New Mexico	116,000	106,000	107,950
Oklahoma	396,300	405,000	393,250
Texas	2,328,675	2,255,000	2,306,050
Dist. 1 (Southwest)	24,150	.....	23,600
Dist. 2 (Southwest)	160,500	.....	161,175
Dist. 4 (Southwest)	246,700	.....	245,250
Dist. 3 (Gulf Coast)	498,000	.....	487,385
Dist. 5 (Eastern)	40,675	.....	39,480
Dist. 6 (Eastern)	118,225	.....	116,825
East Texas Field	310,275	.....	324,000
Dist. 7-C (West)	41,000	.....	39,560
Dist. 8 (West)	634,950	.....	618,230
Dist. 7-B (W. Central)	40,725	.....	39,400
Dist. 9 (N. Central)	127,625	.....	127,525
Dist. 10 (Panhandle)	85,850	.....	83,620
Wyoming	118,790	122,000	121,600
Total United States	*5,189,100	5,152,000	5,172,490
Change from prev. wk., up	16,610		

Total production January 1-September 6. †1,240,555,765 bbl.
Same period last year (crude plus cond.) 1,179,911,247 bbl.

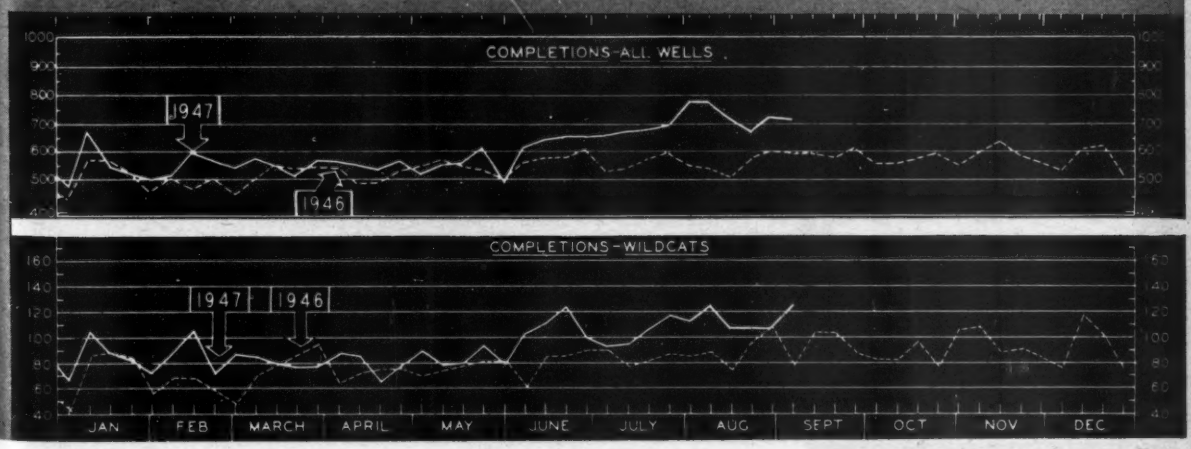
*Not incl. 41,910 bbl. condensate. †Incl. 7,735,870 bbl condensate.

OIL STOCKS IN THE UNITED STATES



DAILY OPERATIONS

Solid line charts weekly completions, service wells in Eastern area included.

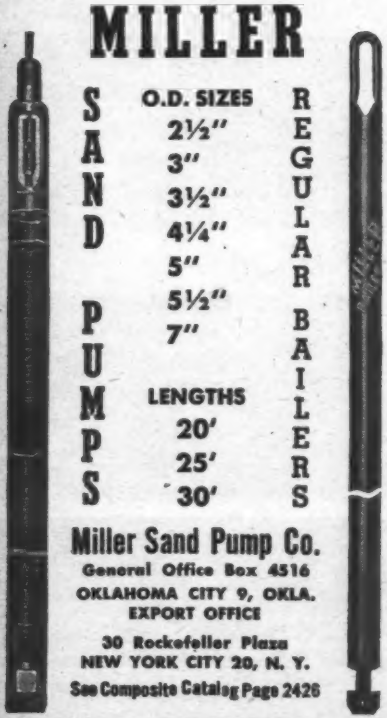


PENBERTHY
SUMP PUMPS

Used wherever seepage water accumulates, the Penberthy Automatic Electric Sump Pump and the Penberthy Automatic Drainer (water or steam operated) have demonstrated their superiority in this service. Simple and rugged design—copper and bronze construction throughout.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

INCREASE PRODUCTION
Clean Out With
MILLER



SAND PUMPS

O.D. SIZES	LENGTHS
2½"	20'
3"	25'
3½"	30'
4¼"	
5"	
5½"	
7"	

REGULAR BAILERS

Miller Sand Pump Co.
General Office Box 4516
OKLAHOMA CITY 9, OKLA.
EXPORT OFFICE
30 Rockefeller Plaza
NEW YORK CITY 20, N. Y.
See Composite Catalog Page 2426

MARKETS

NATURAL gasoline yielded to the pressure of continued extremely heavy demand late last week, and prices advanced ¼ cent, both in Oklahoma and North Texas.

New prices of the 26-70 grade in Oklahoma was 6⅜ cents; in North Texas, 5⅛ cents. The price rise was largely the result of activity in the motor-fuel market with refiners using the maximum amount of blending material to satisfy the current record-high gasoline requirements.

Several major natural-gasoline suppliers in the Mid-Continent area admitted they are unable to meet all calls for their products. In addition to motor-fuel users several other factors were adding to the natural-gasoline demand. These included increasing calls for light fractions because of renewed manufacture of aviation gasoline for the Government and the necessity of stepping up L.P.G. yields with the approach of the winter season. One natural-gasoline marketing official said a greater number of producers are now taking the product in kind as provided under contracts in force.

Seasonal Slump Gone

In years past, natural gasoline often slumped drastically in price in the spring and picked up again in the fall with the increasing use of volatility in motor fuel. During the last year, however, the natural-gasoline market leveled out the traditional fluctuation, and demand and price steadily mounted during the summer.

Market conditions for other petroleum products were largely unchanged last week. Demand for gasoline showed little or no signs of slackening, and distillate heating oils were still bringing premiums ranging up to a full cent.

Some softness was reported in prices for residual fuel oil because industrial buyers apparently had reached the limit of storage. No. 6 was said to be available for $2 on the spot market. This condition was regarded as temporary, and suppliers expected calls to pick up with colder weather.

Heating-Oil Premiums

Midwestern jobbers and distributors of heating oils continued to search the Mid-Continent and Gulf refining areas for supplies for winter delivery. One refiner reported selling No. 2 under a contract arrangement providing 1 cent above the published price of 6⅞ cents. Another refiner reported selling range oil on the open market at ⅝ cent above the market price for 42-44 kerosine.

Sale of No. 5 fuel oil at $2.35 in buyer's cars was reported last week. Few spot sales of gasoline were listed. One refiner said he had been able to pick up a few cars of regular grade 9½ cents, f.o.b. North Texas, in his own cars. He added he had received offers ranging up to more than 11 cents for regular.

In New York, as elsewhere throughout the country, open trading in petroleum products was at a virtual standstill. Kerosine stocks appeared to be at a comparatively higher level and other stocks were described as fair.

As a result of the action of Standard Oil Co. of New Jersey in reinstating Gulf Coast cargo market postings, some New York harbor suppliers were said to feel less "squeezed" as a result of the relatively lower price level in New York.

Representative Quotations

Representative spot-market quotations of leading suppliers as of September 8, 1947. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor	Texas Gulf Coast
Regular gasoline, 73-75 octane	8.75-9.5	10.5-10.9* 9.3-9.10†	9-10
Premium gasoline, 78-89 octane	9.5-11.25	10.2-12	9.5-10.5
42-44 w.w kerosine	7.5-8	7.8-8.3	7.5-8
No. 2 straw fuel oil	6.875-7.875	6.8-7.2	7.75
No. 6 residual	$2-2.45	$2.22-2.52	$2.00-2.75

*Branded (74-76 octane); †Unbranded (74-76 octane).

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	6.375	5.875	6.125
Grade 18-55	7.65	7.05	7.35

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	11.5-12.5
750 vis., No. 3-4 neutral	13.75-15.25
2,000, No. 5-6 neutral	15.25-16.75

LUBRICATING OILS
Mid-Continent

150-160 vis. D bright stock, 0-10 p.p.	20
200 vis. No. 3 neutral, 0-10 p.p.	18-19

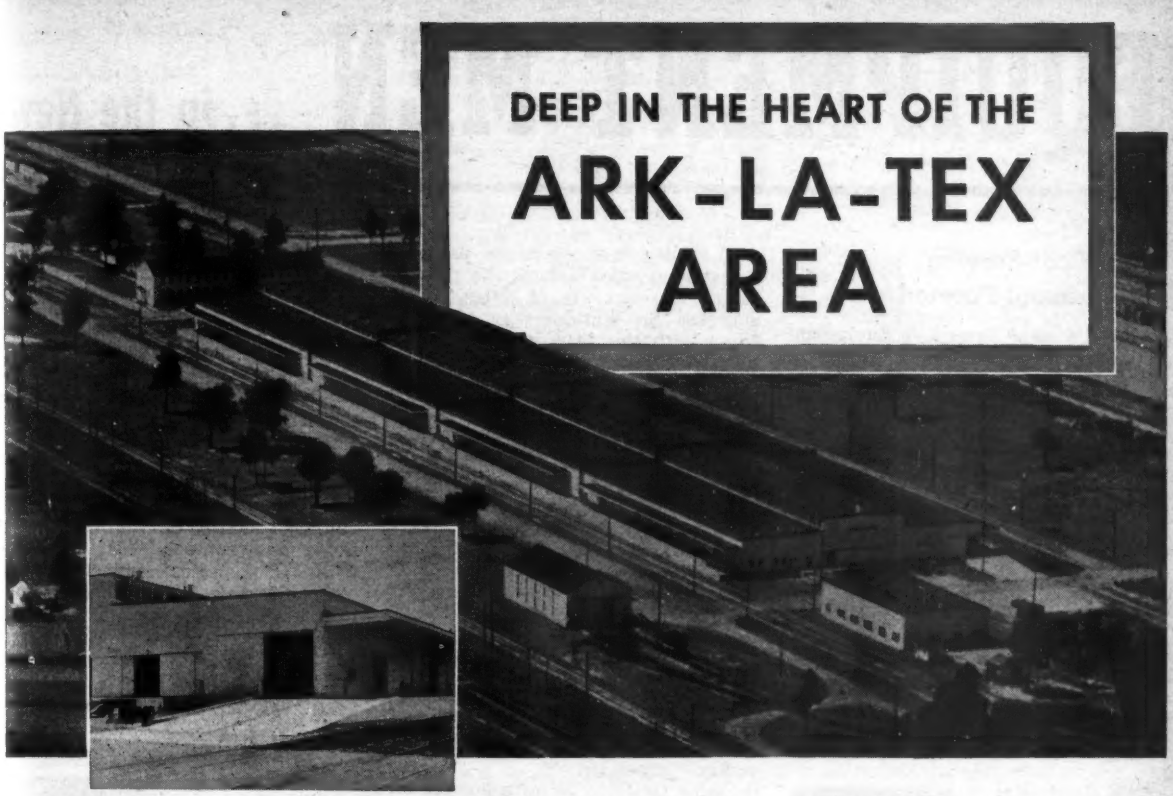
Western Pennsylvania

145-155 vis. 10 p.t. bright stock	45
180 vis. 0 p.t. neutral	43

CRUDE-SCALE WAX
Mid-Continent

130-132 A.S.T.M. melting point	6.75-7.75

DEEP IN THE HEART OF THE ARK-LA-TEX AREA



Well-built, Adaptable Manufacturing, Processing or Warehousing Space Available Now

Former Shreveport, Louisiana, Quartermaster Depot, for sale or lease in whole or major part

ARK-LA-TEX Serve 36,000 oil and gas wells now operating in the Ark-La-Tex (Arkansas-Louisiana-Texas) Area from its geographical center, Shreveport. Oil and gas field equipment manufacturers and service-repair organizations will find Shreveport an ideal location for efficient, economical operation.

Industrial plant space, 523,452 sq. ft. of it, in three buildings alone, is available now at this former Shreveport Quartermaster Depot. Many types of manufacturing, processing and fabricating can be accommodated here.

THE BUILDINGS. Three buildings are each 181′ x 964′, of frame construction, with built-up roofs. Each building has 174,484 sq. ft. of floor space with concrete floors and loading docks. Two are equipped with ventilating fans. The third is heated by 96 gas-fired space heaters. Clearances from floor to beams are from 13 ft. at sides, to 18 ft. at centers.

Administration Building is 37′ x 157′, two-story, concrete pier foundation, wood floor, wood frame walls, subdivided for office space.

Other buildings, some 42 in number, are also offered.

COMPLETE INFORMATION. Write now for a detailed description of individual buildings. Address all inquiries to the Regional Office address given below.

THE SHREVEPORT LOCATION. This 337-acre property lies about 1½ miles south of Shreveport, adjacent to the industrial Cedar Grove district. Shreveport is 50 miles from the Winnfield, Louisiana, limestone deposit extensively used in Louisiana as calcium supply.

★ ★ ★

The Texas and Pacific Railroad and Kansas City Southern Railroad serve the plant area. Both railroads have track connections with the *18 miles of trackage* located inside the depot property. This trackage is of 85-lb. rail.

★ ★ ★

Utilities are available. A large, concrete water reservoir is used for fire protection. The plant is served by paved roads.

SEALED BIDS. Your sealed proposals, on Standard Bid Forms, must be received by 3:00 P.M., C.S.T., October 17, 1947, at War Assets Administration, Office of Real Property Disposal, 7020 Franklin Avenue, Station D, New Orleans 17, Louisiana. Qualifying small business may purchase through RFC's priority.

Address all requests for bid forms and property descriptions to:

WAR ASSETS ADMINISTRATION
OFFICE OF REAL PROPERTY DISPOSAL

7020 FRANKLIN AVENUE, STATION D, NEW ORLEANS 17, LOUISIANA

1328-T

EQUIPMENT MEN ... in the News

Technical Service Department Formed

International Derrick & Equipment Co. has announced the establishment of a Technical Service Department for both domestic and foreign trade with headquarters at Dallas. Members of the department are specially trained engineers who have made thorough studies of the design, construction, operation, and servicing of each item of equipment. Their thorough training plus broad experience in the industry qualifies them as oil-field machinery specialists. Their services are available for specific problems as well as group meetings of distributors and sales personnel. They also work with the trade either direct or through the customers elected source of supply.

N. J. HERMAN

B. JOHNSTON, JR.

E. F. SHIELS

Members of the Technical Service Department are: N. J. "Tiny" Herman, who assisted in the designing and engineering of the Triplex slush pump and the Clark-Ideco power rig; Blaine Johnston, Jr., who assisted in the design and production of the Rambler rig and Hydrair hoist; and E. F. "Gene" Shiels, who assisted in the design and production of power rigs at the Beaumont and Columbus plants and has been active in the Mid-Continent area where he has checked power rig performance and service requirements.

Southern Alkali Names Haley

E. Wayne Haley has been named director of sales for Southern Alkali Corp. Southern Alkali is a subsidiary of Pittsburgh Plate Glass Co. Associated with Southern Alkali since 1935, Haley has served as assistant director of sales during the past 12 years. As director of sales, Haley succeeds Eli Winkler who will continue with the firm in the capacity of sales consultant. Haley will maintain headquarters at 30 Rockefeller Plaza, New York.

Corry New Southwestern Sales Head

S. E. Corry has been named southwestern division sales manager for Franks Manufacturing Corp., Tulsa, with offices at 320 Bankers Mortgage Building in Houston. Franks has recently expanded its sales facilities by offering its entire line of products, including skid, truck and trailer-mounted rotary drilling rigs and servicing units through supply stores.

Clark Brothers Revises Export Management

T. Fred Hudgins has resigned as export manager in the New York office of Clark Brothers Co. He leaves to found his own business in Dallas. R. R. McCartney, while retaining his post as Clark Brothers district manager, will assume Hudgins' duties as export manager. Avery G. Van Campen, who has headed the technical service department in the New York office, will be the sales engineer. Robert Spears, for a number of years in the technical service department in the home office at Olean, N. Y., and who was recently transferred to the technical service department of the New York office, will take over Van Campen's post as head of that department.

B. S. & B. Establishes Research Department

Black, Sivalls & Bryson, Inc., has set up a department of market research and analysis under direction of Robert E. Bingham of Kansas City. The department, a part of the industrial and public-relations division, will ascertain long-range consumer needs, making possible the coordination of production to fit these needs as they arise.

Grinnell Opens New Branch Warehouse

Grinnell Co. has opened a branch warehouse, sales office, and showroom in Long Beach, Calif. The new building, of 15,000 sq. ft, plus 25,000 sq. ft. of pipe yard and outside storage, is located at 1360 West Pacific Coast Highway. It is strategically situated to serve the entire harbor area comprising Long Beach, Wilmington, and San Pedro as well as the oil fields and refinery district. W. F. (Bill) Cook, sales engineer at the company's Los Angeles branch since 1938, has been appointed branch manager.

Gar Wood Makes Sales Changes

Gar Wood Industries, Inc., has named E. D. Wallace sales manager of its Buckeye Traction Ditcher Division at Findlay, Ohio. He has had 20 years' experience with heavy construction equipment, the last 10 of which have been with Buckeye as a district representative. W. C. Petersen has been appointed service manager of the division at Findlay. W. E. Dawson and W. R. Steenrod, formerly district representatives for Buckeye, have been appointed district managers-general line for Gar Wood Industries, Inc. Dawson will have the West Coast territory and Steenrod will center his activities in Milwaukee.

E. D. WALLACE

Airetool Names Thornson

Thor Thornson has been named general sales manager of Airetool Mfg. Co. He will be in charge of sales, advertising, and promotion. Airetool manufactures tube cleaners and expanders, as well as accessories, for every type of tubular construction in oil refining and other industrial fields.

Manzel Doubles Capacity, Changes Name

Manzel Brothers Co., Buffalo, has changed its name to Manzel, Inc., and completed an extensive expansion and modernization program. The floor space of the Manzel plant in Babcock Street has been doubled by an addition completed several months ago. A more recent addition increases office area by 150 per cent. Employment has risen from 98 in 1945 to 251 in September 1947 and is still rising. Rapid expansion has been made necessary by demand for force-feed lubricators and chemical feeders; by promotion of products in several new markets, including hydraulic valves and other mechanisms, and by the recent purchase of the Bowser and Torrington lubricator repair and replacement business from Bowser, Inc., which has discontinued manufacturing this equipment.

Personnel Changes In Halliburton

The following promotions and transfers have been made recently in Halliburton Oil Well Cementing Co. field organization: F. A. Johnson, from assistant superintendent to superintendent of the Southwest Texas division, with headquarters at Corpus Christi; R. B. Beddingfield, assistant superintendent, South Louisiana division, New Orleans, to superintendent, South Texas division, Houston; J. E. Lacy, superintendent, California division, Los Angeles, to superintendent, Kansas division, Wichita; C. T. McGuire, superintendent, Rocky Mountain division, Denver, to superintendent, California division, Los Angeles; Coy O. Pace, assistant superintendent, West Texas-New Mexico division, Midland, to superintendent, Rocky Mountain division, Denver; J. B. Jones, sales fieldman, Oklahoma-North Texas division, Oklahoma City, to assistant superintendent, Southwest Texas division, Corpus Christi; Ed Paramore, fieldman, Salem, Ill., to assistant superintendent, South Louisiana division, New Orleans; and P. C. Mayfield, division personnel director to assistant superintendent, West Texas-New Mexico division, Midland.

Thermoid Appoints Bell and Berry

M. R. Bell of Cleveland has been named assistant rubber-production manager for Thermoid Co., Trenton, N. J. He becomes assistant to Lester F. Cox, vice president for production. After several years in plastic development work with National Carbon Co., Vinylite Division, Cleveland, he became associated with the Aeronautical Division, B. F. Goodrich Co., on the correlation of designs for aircraft components. Bell spent 4 years in war production as plant manager for the Aeronautical Division of Pharis Tire & Rubber Co. in Parkersburg, W. Va. More recently he has been engaged in consulting and design and has also been active in the widely expanding labor-relations field.

L. I. Berry has been appointed production engineer for the molded-hose division. Coming to Thermoid after serving as superintendent of construction and installation of new equipment for Hewitt Rubber Co., Buffalo, Berry also devoted many years to molded-hose development and production with U. S. Rubber Co. and its subsidiary, Mechanical Rubber Co., Cleveland.

Tube Turns Names West Coast Manager

Lewis M. (Lou) Bound, Jr., has been named West Coast manager of the welding fittings division of Tube Turns, Inc., Louisville. Bound has headquarters in San Francisco.

LeTourneau Announces Changes in Executive Staff

R. E. McCLUSKEY

R. G. LeTourneau, Inc., recently has completed the first phase of a reconversion program by announcing several changes in the executive staff. Roy E. McCluskey, assistant treasurer, has been advanced to the position of vice president in charge of sales. In his new position he will direct the company's sales divisions as well as other related departments. McCluskey's appointment coincides with the resignation of Oscar W. Nelson as vice president and general manager of the Peoria division. Another executive change is the resignation of Robert F. Nelson as vice president and assistant to the president. Nelson is continuing his affiliation as a member of the board of directors, a position he has filled since March 1944, and will maintain his executive offices in New York City.

Borg-Warner Retains Deck

E. W. Deck, until recently general manager of Trent Tube Manufacturing Co., has been retained by Borg-Warner Corp. as a consultant on manufacturing research.

White Joins Oil Center Tool

Ed White, former national intercollegiate golf champion, has joined the sales force of Oil Center Tool Co., Houston.

Cooper Announces Incorporation

F. E. COOPER

Effective September 1, 1947, the Fred E. Cooper organization has been incorporated as Fred E. Cooper, Inc. Officers named are Fred E. Cooper, president and treasurer; Harold E. Cooper, executive vice president; Howard B. Appleton, secretary; and Margaret Megill, assist treasurer. The firm will continue

H. E. COOPER

H. B. APPLETON

to manufacture, sell, and service, on a world-wide basis, Allis-Chalmers winch-tractor and skid-winch well servicing units. The firm will also continue to handle, on an exclusive basis, the domestic distribution of Allis-Chalmers oil-field power units.

A number of changes have been made in the nation-wide sales organization of Fred E. Cooper, Inc. B. R. Wiggins, formerly district sales engineer in the San Joaquin Valley, has been made Pacific Coast sales manager with headquarters at the branch plant in Los Angeles. His place in the San Joaquin Valley district has been taken by Arthur D. Brunk. O. F. Richardson, with headquarters in Corpus Christi, will cover South Texas west of Corpus Christi including San Antonio and the Rio Grande Valley. Allen T. H. Graham, located at Charleston, W. Va., will handle the West Virginia, southeast Ohio, and eastern Kentucky district. C. H. Hudson at Casper, Wyo., will represent the company in the Rocky Mountain region.

The general offices and manufacturing plant are located in Tulsa, while branch plants are maintained at Houston and at Lynwood, Los Angeles, Calif.

Rheem Forms Canadian Subsidiary

Rheem Manufacturing Co. announces the formation of a subsidiary company in Canada, to be known as Rheem Canada, Ltd. The offices and plant of the new company are located in Hamilton, Ont. The president of

(Continued on page 169)

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads except Situations Wanted, 10 cents a word. Minimum charge, $2.00 per insertion.
Situations Wanted ads, 5 cents a word. Minimum charge, $1.00 per insertion.
Centered Line, any ad, 75 cents.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$9.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE: 150,000 board feet of used road lumber located in Thornwell Pool Section 25-11-5w, Jefferson Davis Parish, Louisiana. Please contact O. C. Brown, Cities Service Oil Company, Gladewater, Texas.

1—1½ Ton Dodge, 1—½ Ton Pickup, 2 HS Cardwell Units, 1 Cardwell Mast. Tools and Lines. All in good condition, $6500.00. David Litan, Box 91, McPherson, Kansas.

FOR SALE: Shaffer power draw works, powered by two J. L. 1335 Buda engines compounded. Suitable for 5,000 foot work. In A-1 condition. Price $7,500. Terms. Melton Well Service, Box 1360, Seminole, Oklahoma.

PUMPING UNITS FOR SALE

1—2-A-31C Lufkin Twin Crank Unit W/International engine, 3 well hookup W/American jacks, complete.

2—O.C.S., Goslin, 10 H.P., Twin Crank Units W/1 Waukesha and 1 Allis-Chalmers engine.

2—No. 14D Jensen, Twin Crank Units W/F & M 346 engine, 2 well hookup W/American jacks, complete.

Western Pipe & Equipment Co.
922 Neil P. Anderson Bldg.,
Phone 2-5688, Fort Worth, Tex.

EQUIPMENT FOR SALE

FOR SALE: 10,000 sq. ft. steel airplane landing mat, 15" x 10' Sections. Will make into portable all-weather lease road for hauling equipment, etc. 10c per sq. ft., F.O.B. Tulsa, Oklahoma. Subject to prior sale or withdrawal. Also have several light plants at bargain rates. Marshall Travis, 110 Midco Bldg., Tulsa, Oklahoma. Phone 5-2251.

FOR SALE: Model K Cardwell, perfect condition w/5" & 7" tools complete. Morris & Son, Box 107, Carmi, Illinois.

FOR SALE: 25,000 feet of ⅞" National Grade 81 Sucker Rods. These rods are from light Bromide wells and are in excellent condition. A. D. English, Box 612, Ada, Oklahoma. Phone 2805.

FOR SALE: Oil well servicing unit—One model R Cardwell single drum unit with DAK Waukesha natural gas or gasoline motor, drum spools, 9500 feet ⅜" wire line. Price, $5250.00. One complete set of rod and tubing tools including 1250' ⅞" tubing line, paromount rod hanger complete, small light plant. Price $1250.00. One 1942 GMC tandem truck in excellent shape with good rubber. Price $1750.00. Complete unit, truck, and tools. Price $7500.00. B&R Well Servicing Co., Box 201, Perry, Oklahoma.

STORAGE TANKS FOR SALE

Three 80,000 bbl. riveted storage tanks with steel roofs and structures, in excellent condition, now being dismantled. Diameter 117'-2"; height 41'-10"

Also have new 10,000 bbl. cone deck bolted steel tanks.

Phone: TRinity 2091

R. H. TECHLENBORG CO.
811 West 7th St.
Los Angeles 14, California
Cable address: RAYTECK

FOR SALE

1—Ditching Machine, Model 46, Buckeye, 6' Cutting Depth, 42" Wide, Gasoline Driven, Serial #3690.
1—Ditching Machine, Model 48, Buckeye, 8' Cutting Depth, 42" wide, Gasoline Driven, Serial #3776.
1—Backhoe, Buckeye Model 70, 35' Crane Boom, Fairlead Dragline, ¾ yd. Bucket ¾ yd. Trench Hoe, Motor #14414, Serial #C-36-520.
1—Tractor, RD-8 Caterpillar, Model B5-620, Serial #1H1508 with Berg Sideboom, Serial #475.

Above Equipment Available for Inspection

MORRISON BROS. CONSTRUCTION COMPANY, Inc.
P. O. Box 1000 Phone 414
Glasgow, Kentucky

FOR SALE

25—35,000 bbl. wood-roof tanks. Will match-mark and load shells and bottoms on cars Martinsville, Illinois. Plates 5 x 10 riveted. Good condition. International Trading Syndicate,

P. O. Box 1858
Tulsa, Oklahoma. Phone 3-6141.

EQUIPMENT FOR SALE

FOR SALE OR EXCHANGE—Model R. L. Double Drum Beam Type Cardwell Unit #KLGKD-234 with American Simplomatic Cathead and Spinning Line Cathead, Rotary Drive, completely assembled on Rotary Drilling Rig. Now in operation if contacted immediately. Will sell or exchange on Cardwell Spudder. Shawver-Graham, Inc., 204 N. Market, Wichita, Kansas.

Sullivan 200 Core Drill; 47 foot mast; 5 x 8 Gradner-Denver pump; pump and rotary motors; all mounted on large ten wheel tandem White truck; 2550 feet of 2⅞ full hole Hughes Streamline pipe in 30 ft. length; twenty foot Reed dropshot core barrel; 500 gallon water tank on skid; 500 gallon gasoline tank on trailer; other parts and equipment with rig. Can be used for exploration work; 2300 foot production drilling with 2⅞ pipe or 3000 feet with 2⅜ pipe. Located in South Texas. J. W. Sewell, Mercantile National Bank Building, Dallas, Texas.

FOR SALE: Model 55 Wichita Spudder less mast with PA-100 International engine in good condition. Located close to Pampa, Texas. Nabob Oil & Gas Company, Box 448, Amarillo, Texas.

FOR SALE: 1 Cardwell double drum draw works, Serial Number RL 137 with 150 h.p. GAKU Waukesha motor. Anyone interested please write owner direct: 701 Bitting Bldg., Wichita 2, Kansas.

NEW PUMPS FOR SALE

New Gaso Fig. #1800—4½" x 6" with engines—3"—2 Stage Byron Jackson with and less engines—Hale Chrysler Fire Pumps with engines—Aurora Model AD2 with engines—Lombard Fig. #1684 with engines—Novo Model KH2 with engines.

Write for Specifications and Prices

H. A. McCARTHY
310 Thompson Bldg. Phone 5-3298
Tulsa, Oklahoma

SHOT HOLE DRILLS

Large and Small

All are truck mounted, rotary, chain pull down, smallest pump size 4 x 6. Some are in excellent condition; others need repair. Price F.O.B. Dallas, from $3,000 to $8,000, including truck.

For details write

8800 LEMMON AVENUE, DALLAS, TEX.

HYDRAULIC PUMPS

Aldrich Pump Co. Vertical Triplex HYDRAULIC PUMPS, 2¾" x 8", equipped with Herringbone gears, 67.5 GPM. Maximum pressure for intermittent duty 2,200 lbs., for continuous duty 1,800 lbs. Pump and motor mounted on common bed plate.

Motors are 75 HP, 3/60/220-440 volts, 1740 RPM. Complete with starting panel, consisting of G.E. motor starter switch, push button control, square "D" Switch, and capacitator.

Purchased new 3½ years ago. Excellent condition. Available for immediate delivery.

CONSOLIDATED PRODUCTS CO., INC.
17-29 Park Row, New York, N. Y.